

# **HARMONY 1**

**by Barrie Nettles**

**Berklee**  
COLLEGE OF MUSIC

---

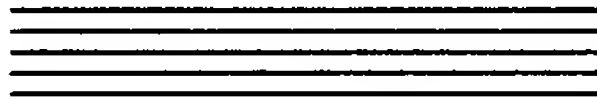
Copyright © 1987 Berklee College of Music  
All rights reserved.

# HARMONY I

Harmony deals with the study of chords and their relationship to one another. The understanding of harmonic practice is essential to the understanding of the language of music. As in learning any language, the first step in the learning process is the development of a vocabulary.

## THE STAFF

The foundation of our notation system is a grid of five lines called a staff.

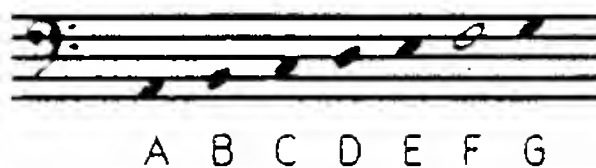


The position of notes placed on the staff visually represents relative "highness" or "lowness" of pitches.



## CLEFS

Each line and space of the staff may be assigned a letter name. The letter names are arranged alphabetically in ascending order: A B C D E F G. The location of the letter names is determined by a **clef** placed at the beginning of the staff. The following example uses the F clef (also known as the bass clef). The F clef locates F below "middle C" on the fourth line of the staff.



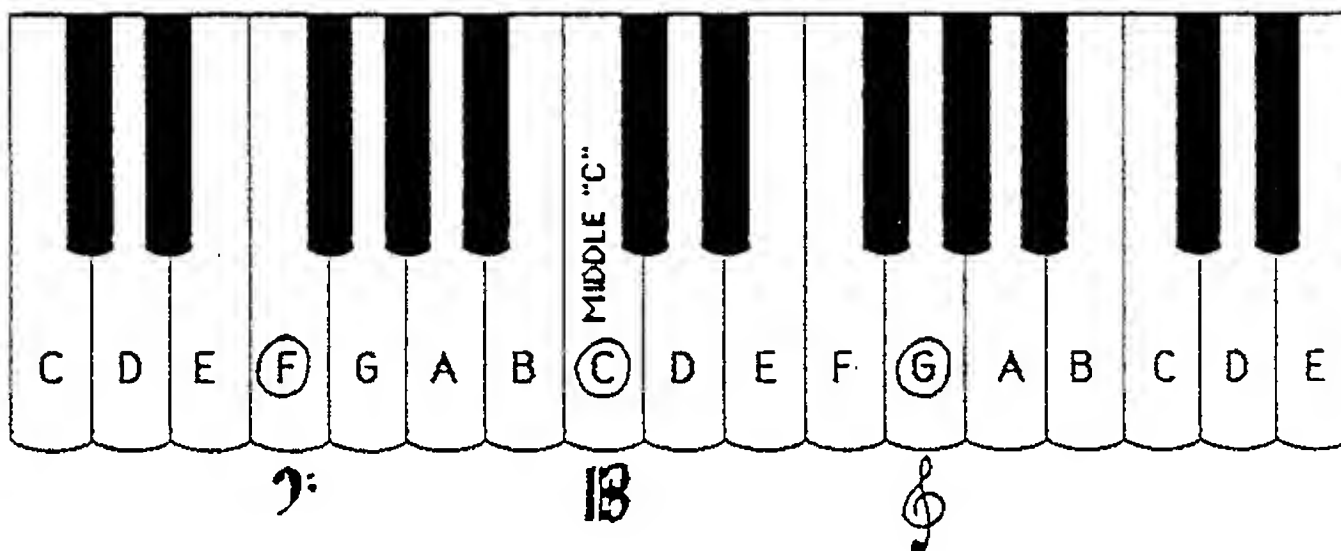
The **G clef**, also known as the treble clef, locates G above "middle C" on the second line of the staff.



The **C clef** locates "middle C" on the middle line (or, in some cases, on the fourth line) of the staff.

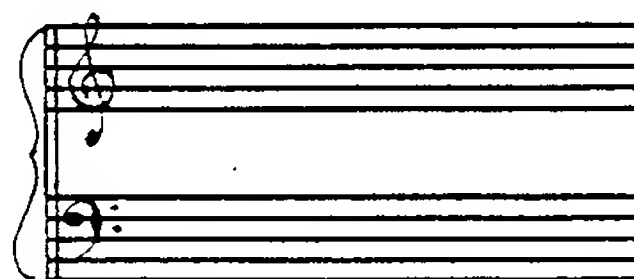


Note that the music alphabet goes from A to G, and then starts over.



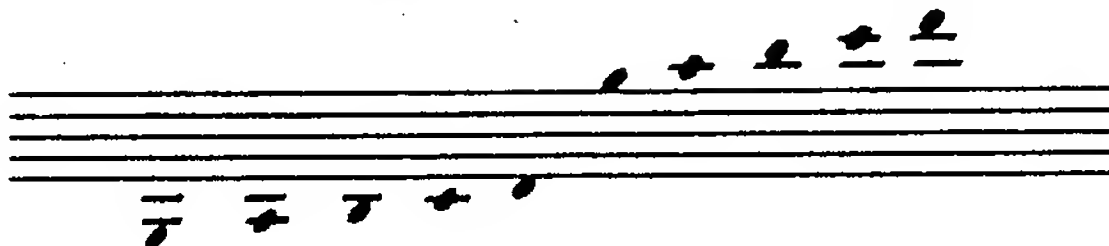
### THE GRAND STAFF

When two staves and the treble and bass clef are used together, the result is called the **Grand Staff** or **Great Staff**.

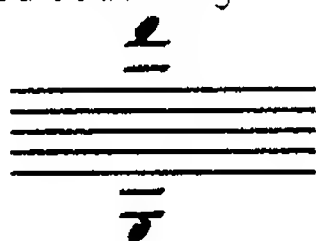


LEGER LINES

Small lines called leger lines are added to extend the staff.



Notice that the notes in the spaces directly below or directly above the staff do not need added leger lines.



The same applies to notes in the spaces beneath or above the leger lines.

\*\*\*\*\*  
\*\*\*\*\*

To summarize, pitch placement devices used in music notation are:

- 1) the **staff**, which shows the high/low relationship between different notes.
- 2) the **clefs**, which locate pitch names given to lines and spaces of the staff.
- 3) the **leger lines**, which extend the five lines of the staff for higher or lower pitches.

The diagram illustrates the relationship between a piano keyboard and musical notation. At the top, a piano keyboard is shown with white keys labeled C, D, E, F, G, A, B, C, D, E, F, G, A, B, C, D, E. The central C is labeled "MIDDLE 'C'". Below the keyboard, a musical staff with a bass clef is shown. A box is drawn around the note F on this staff. Below the bass staff, another musical staff with a treble clef is shown. A box is drawn around the note C on this staff. Arrows point from the keyboard keys to the corresponding notes on the staffs. The staff with the bass clef has a box around the note F, and the staff with the treble clef has a box around the note C. Arrows point from the keyboard keys to the corresponding notes on the staffs.

Homework numbers: 1, 2, 3

ACCIDENTALS

The foregoing information about the Grand Staff covers the letter names of the white keys on the keyboard. What about the other five notes (the black keys)?

In order to maintain the integrity of the alphabet, the other five pitches are represented as alterations of the basic seven pitches. The terms used are sharp and flat. Sharp = 1/2 step higher, written as  $\sharp$ ; flat = 1/2 step lower, written as  $\flat$ . A "C $\sharp$ " is the pitch 1/2 step above C and 1/2 step below D. The sharp sign is placed before the note for reading purposes.

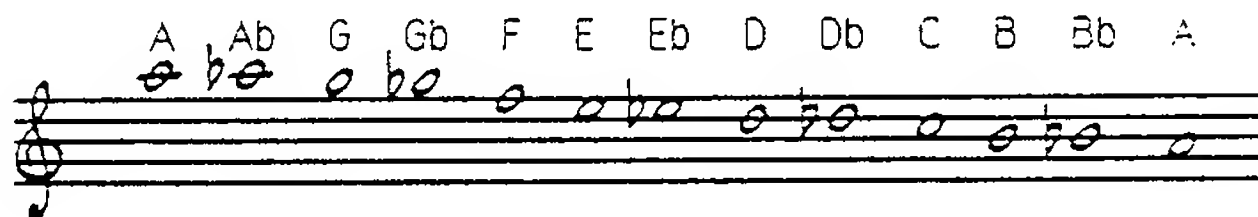


The names of the twelve notes in ascending order are:

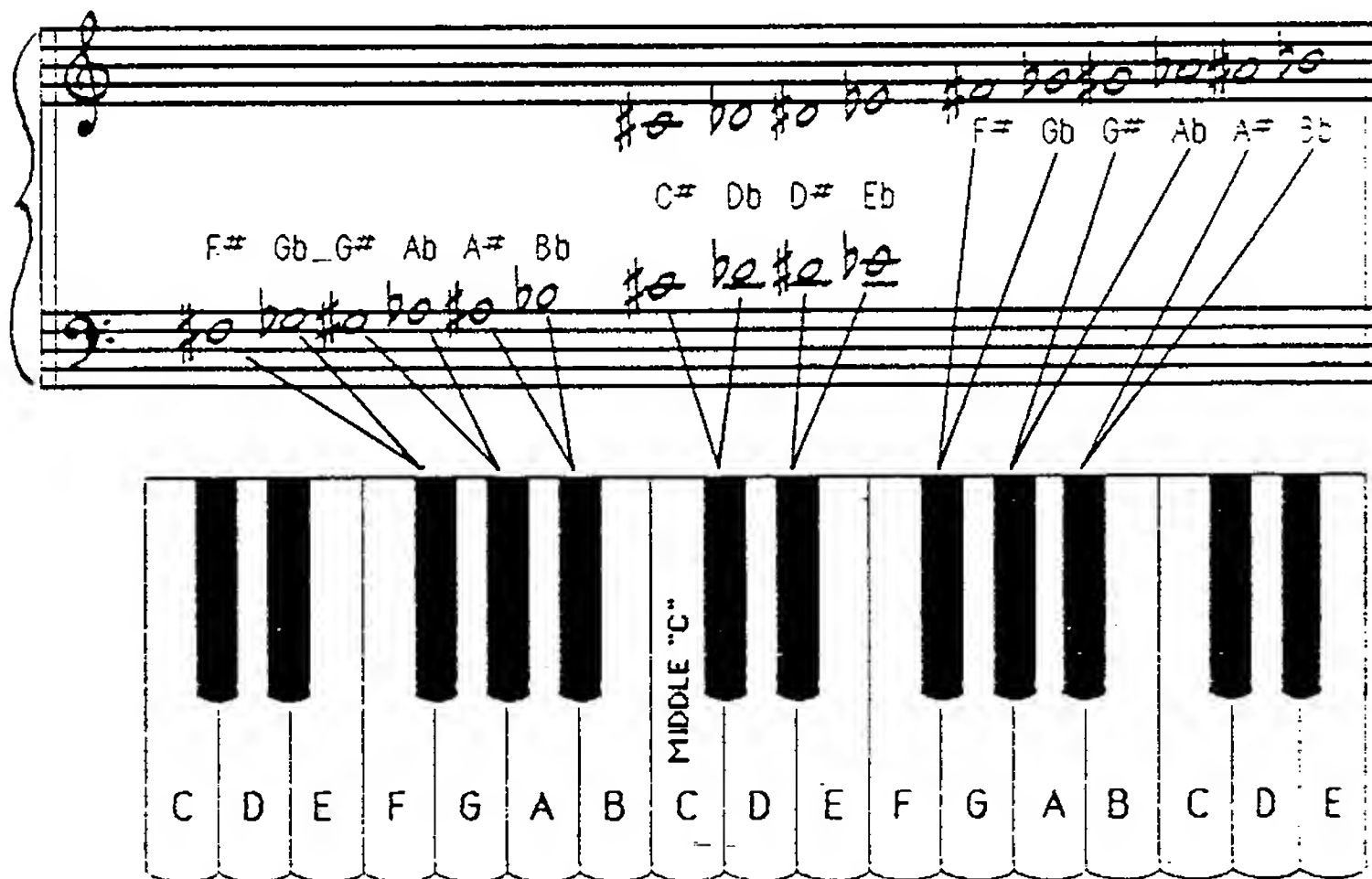


This series of notes is called the chromatic scale. These notes of the chromatic scale may also be examined in descending order.

As with sharps, flats are placed before the notes to which they apply



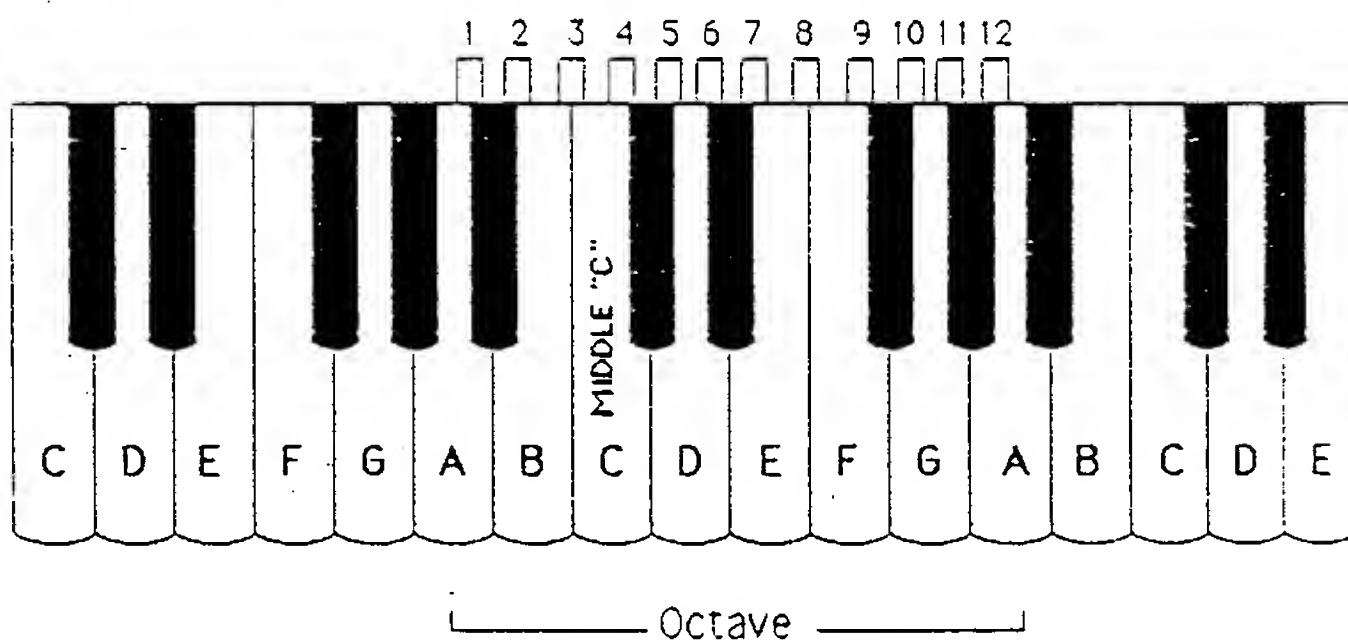
Note that there are two options for naming the five black key pitches (i.e., D<sup>b</sup> or C<sup>#</sup>, E<sup>b</sup> or D<sup>#</sup>, etc.). When there are two (or more) possible names for the same pitch, it is said that enharmonic spelling is being applied.





Once a sharp or a flat has occurred in a measure, there must be a means of cancelling (neutralizing) it so the note reverts to its unaltered condition. The symbol used for this is a **natural** (♮). Collectively, sharps, flats and naturals are called **accidentals**.

Within an octave (eight consecutive letter names), there are twelve half-steps:

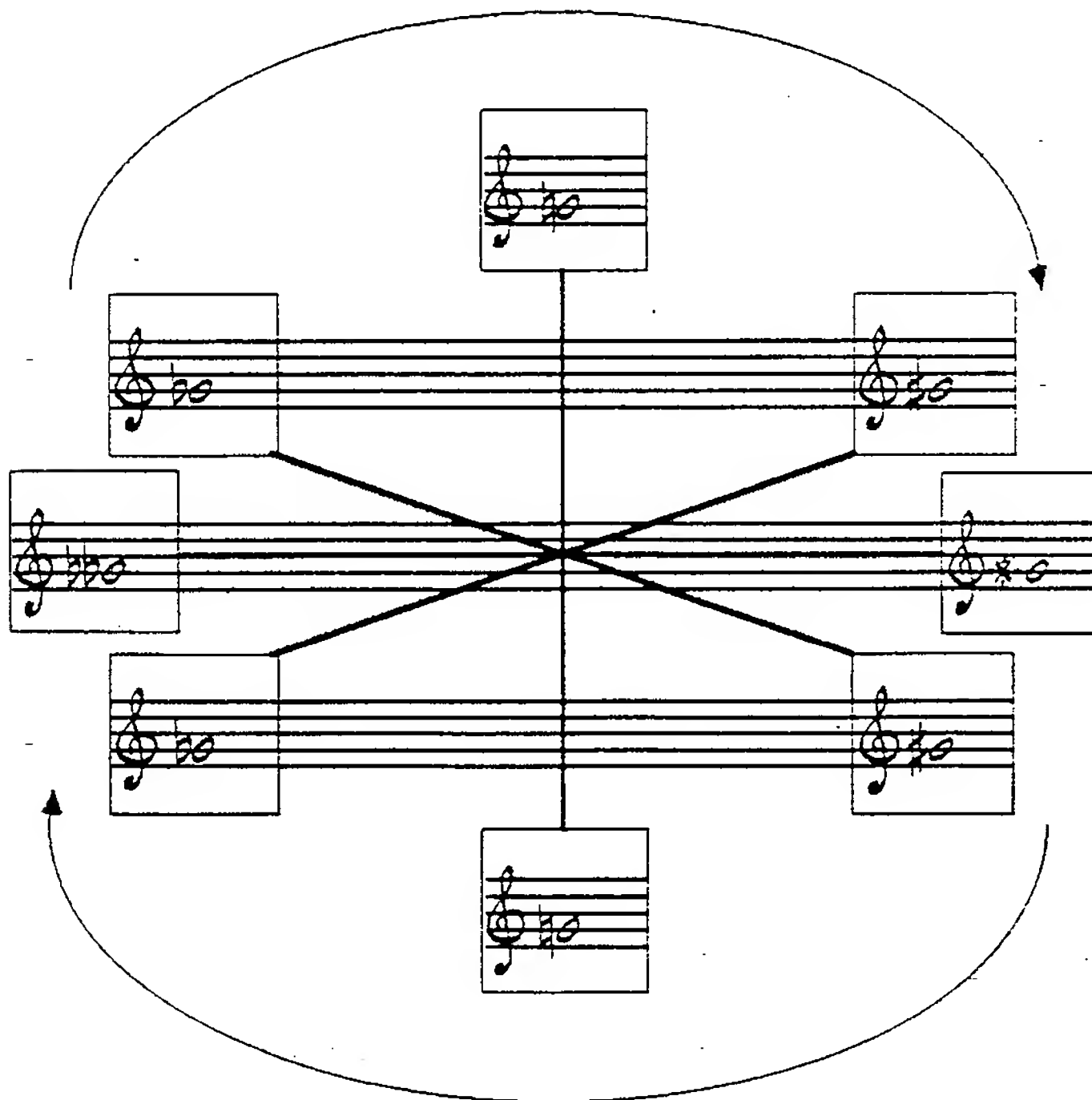


In certain situations, it may become necessary to raise or lower a pitch by two half-steps. The symbols for these purposes are ✖ for a **double-sharp** and bb for a **double-flat**. These symbols are also called accidentals.



\*\*\*\*\*  
 \*\*\*\*\*  
 The rules for sharps (♯), flats (♭), naturals (♮), double-sharps (×), and double-flats (♭♭) are:

1. A natural cancels a sharp or flat.
2. A single sharp or flat will cancel a double-sharp or double-flat respectively.
3. One natural alone will cancel both double-sharps and double-flats.
4. An accidental remains in effect for the duration of the measure it is in, or for the duration of tied pitches, inside a measure or across the bar-line.
5. To raise a note which has already been sharped, use a double-sharp; to lower a note which has already been flatted, use a double-flat.
6. An accidental ONLY affects a specific note, in that octave, in that clef. All other notes of the same name are NOT affected.



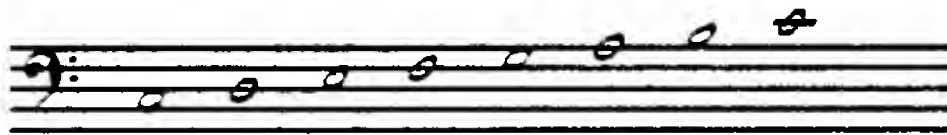
Homework numbers: 4, 5, 6, 7, 8.

A **scale** is a series of ascending or descending notes in a stepwise pattern.



This is a **chromatic scale**. It uses all the notes between the F's and all the pitches move by 1/2 step. (Chromatic implies "1/2 step.")

The following scale uses all natural notes in an octave from C to C:



This is the familiar  
C major scale.

The same notes can be used to begin and end at different points in the order of notes:

D to D	E to E	F to F
D Dorian	E Phrygian	F Lydian
G to G	A to A	B to B
G Mixolydian	A Aeolian	B Locrian

All of the above are scales, but they're not the same kind of scale. The characteristics of the C major scale above are the  $1/2$  steps from the 3rd to 4th degrees and from the 7th to the 1st degrees. The distance between the other notes is a **whole step** (two  $1/2$  steps). In the other scales shown above, the half-steps (from E to F and B to C) occur in different parts of each respective scale. This creates a collection of related scales known as modes. The modes shown above are all relative to the C major scale. This means that each mode starts and ends on a different note of the C major scale.

Here again is the C major scale.



If this stepwise pattern is applied starting on G, the result is a G major scale.



All major scales utilize the same stepwise pattern.

Harmony I 11

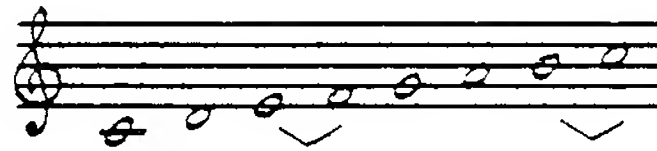
MODE NAMECHARACTERISTICSSCALE

1/2 steps between degrees

(Parallel to "C")

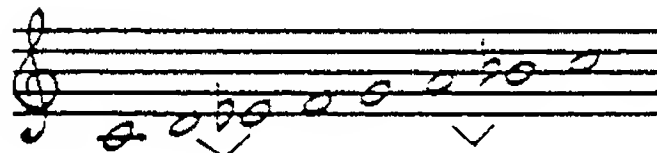
Ionian (major)

3-4; 7-1



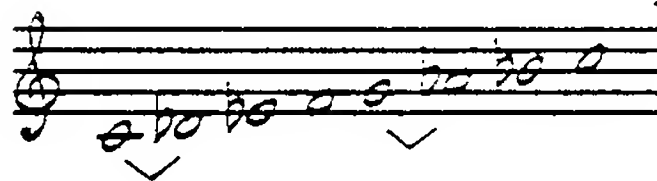
Dorian

2-3; 6-7



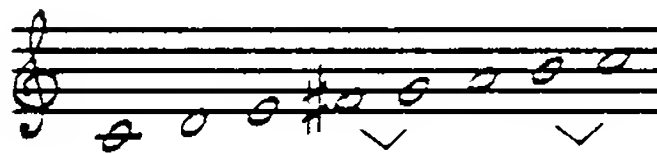
Phrygian

1-2; 5-6



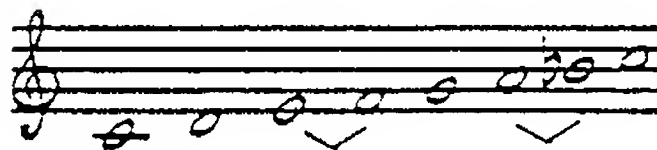
Lydian

4-5; 7-1



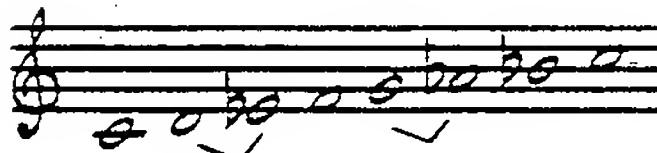
Mixolydian

3-4; 6-7



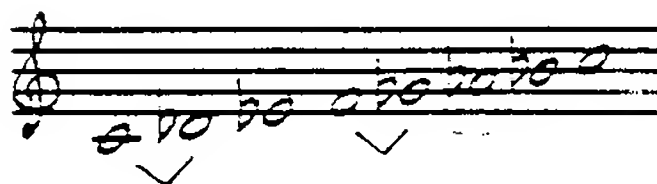
Aeolian (minor)

2-3; 5-6

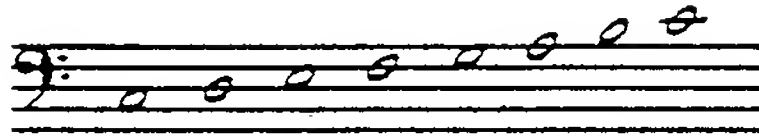


Locrian

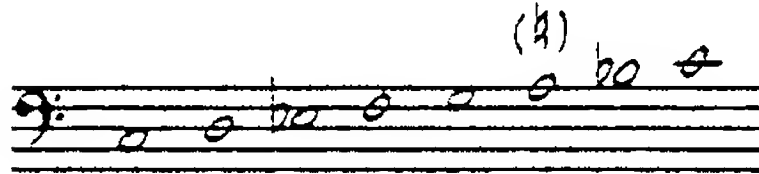
1-2; 4-5



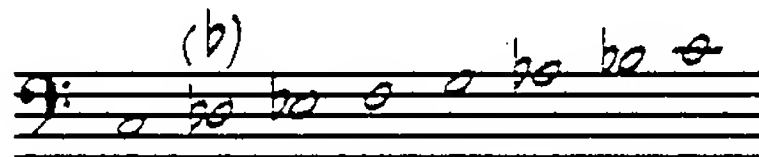
- Scales may also be described by comparing them to the parallel **major** or **minor** scale.



Thus, Dorian mode may be described as a minor scale with the 6th degree raised:



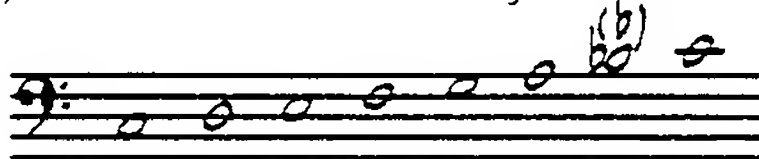
Phrygian mode may be described as a minor scale with the 2nd degree lowered:



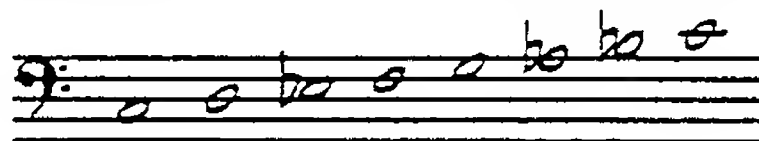
Lydian mode may be described as a major scale with the 4th degree raised:



Mixolydian mode may be described as a major scale with the 7th degree lowered:



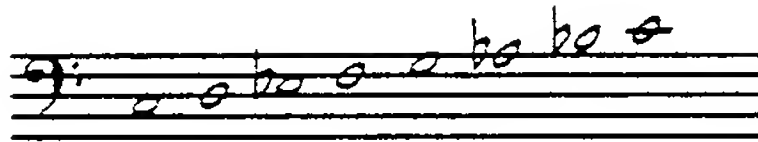
Aeolian mode (also known as the **minor** scale):



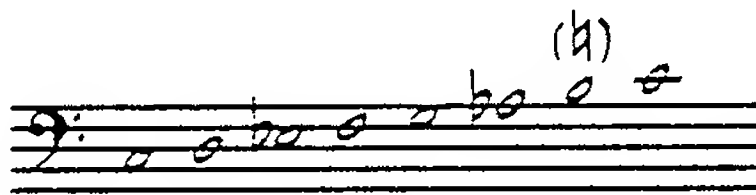
- Locrian mode may be described as a minor scale with the 2nd and 5th degrees lowered:



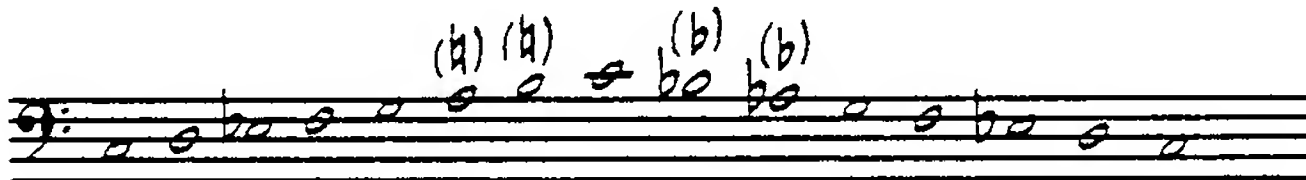
The **minor scale** (Aeolian mode) is also known as "natural" minor or "pure" minor:



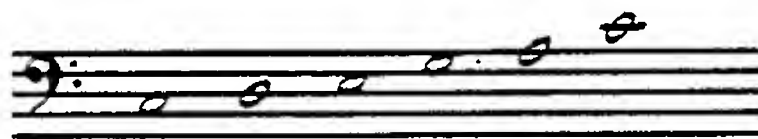
The **harmonic minor** scale may be described as a minor scale with the 7th degree raised:



The **melodic minor** scale may be described as a minor scale with the 6th and 7th degrees raised in its ascending form; in its descending form the melodic minor scale reverts to pure minor:



The major **pentatonic scale** is a five note scale. It contains scale degrees 1, 2, 3, 5, 6 from the major scale, and does not contain any half-steps.



Homework numbers: 9, 10.



## KEY SIGNATURES

**Key signatures** allow us to place the required accidentals of the various scales at the beginning of a piece of music. They are placed directly to the right of the clef:

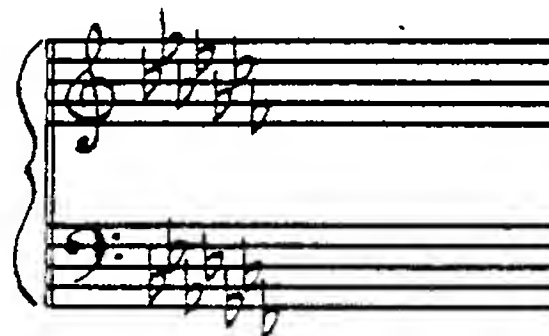


The reader, before reading the music, will look at the key signature and notice the accidentals to be used for all the affected notes. With the accidentals of the key signature at the beginning, the key is recognizable immediately even if there is a lot of subsequent chromatic alteration.



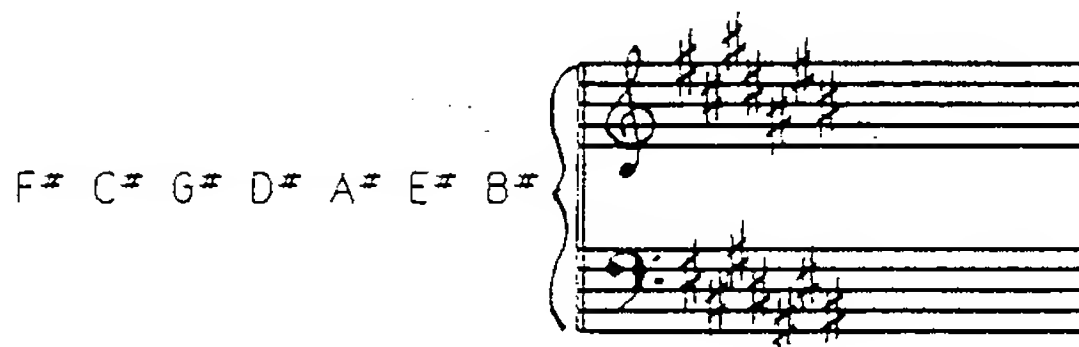
Refer to the homework for scales. The sequence of examples was not arbitrary (C, G, D, A, etc.). This sequence is the result of a phenomenon which you will see throughout the study of music. It is called the **cycle of 5ths**. To be logically sequenced, the building of key signatures follows the cycle of 5ths. The placement and position of the flats in a key signature follows the cycle down in fifths:

Bb Eb Ab Db Gb Cb Fb



The key of Cb has 7 flats (all notes flatted).

The placement and position of the sharps in a key signature follows the cycle up in fifths:



The key of C# has 7 sharps; all notes are sharped.

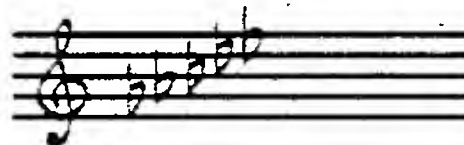
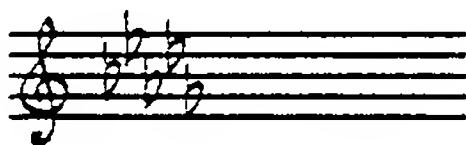
In order to be immediately recognizable, key signatures must always be placed consistently on the staff:



RIGHT

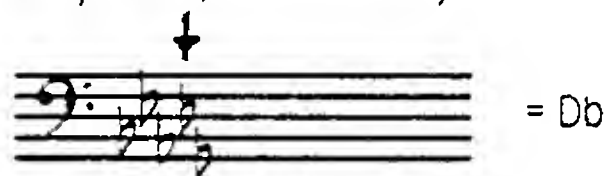


WRONG

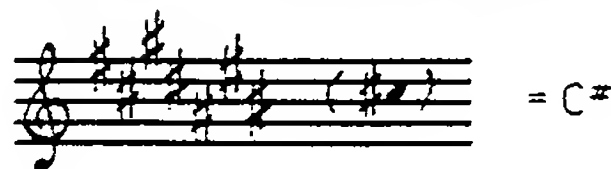


The best way to recognize any key is to know the number of sharps or flats used for it. Another way to recognize the key signature is:

- 1) For flat keys, the key is represented by the flat BEFORE the last flat:



- 2) For sharp keys, the key is a half step ABOVE the last sharp:



- 3) The key signature of one flat is F major. The key signature of no sharps or flats is C major.

Note that there is no necessity to use ledger lines for the placement of any accidentals in a key signature. Unlike the general rules concerning the use of accidentals, key signatures affect all notes of the same name regardless of their octave.

Homework number: 11.

## INTERVALS

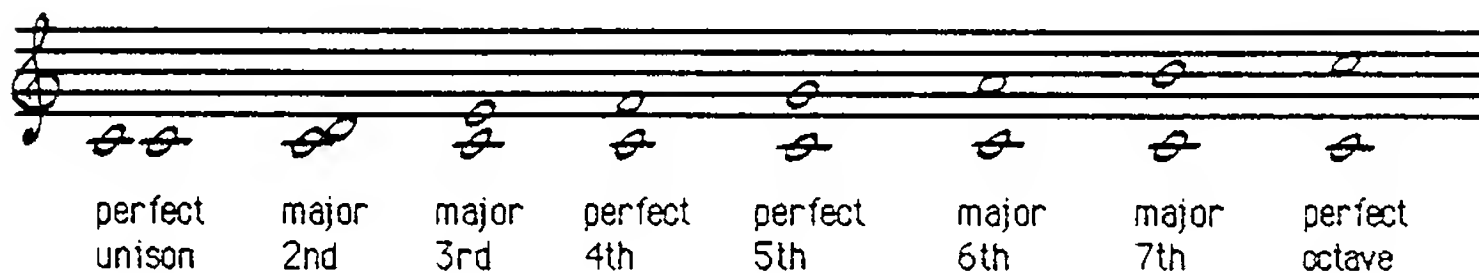
The relationship of adjacent notes in all the previous scales is a whole-step or half-step. As part of our vocabulary, we need a method to identify the relationship between any two notes.

In order to do this, we need a logical means of showing the distance, or **interval** from one note to another.

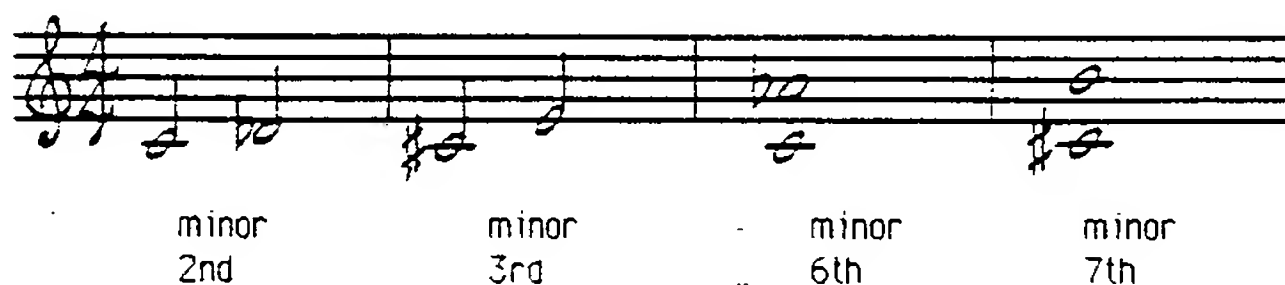
A simple numerical means of accomplishing this is to count each possible staff degree between the two notes to find which number the top pitch represents.



The intervals in a major scale between the first note and the other notes are:

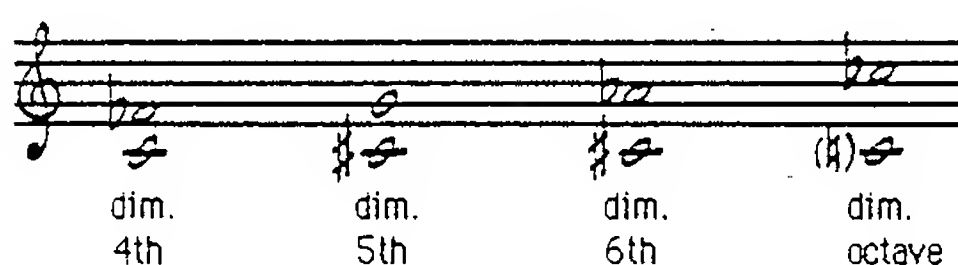


If a **major** interval is made smaller by a half-step (by lowering the top note or raising the bottom note) the major interval becomes **minor**:



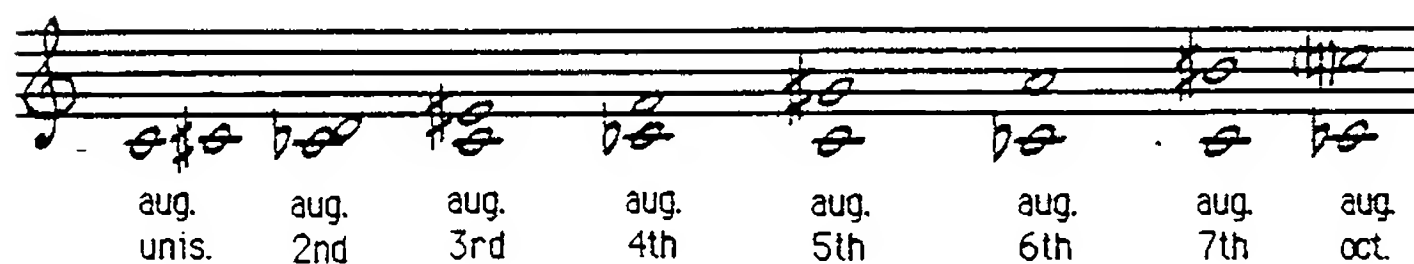
NOTE: Intervals may occur as **melodic** intervals (one note following the other), as the minor 2nd and minor 3rd in the above example, or as **harmonic** intervals (both notes together) as the minor 6th and minor 7th above.

When a minor or perfect interval is made smaller by a half-step, it becomes **diminished**:

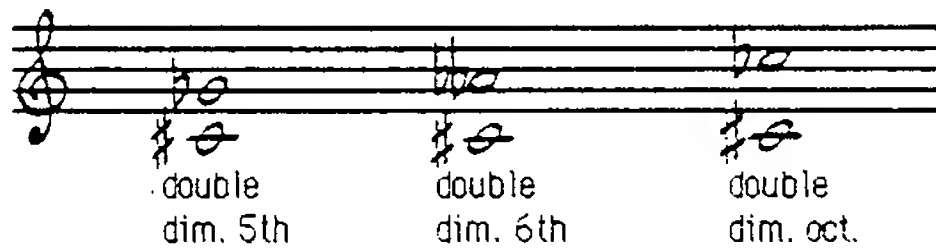


Notice that in all intervallic relationships, one must first count the number of staff degrees involved, and then qualify the relationship.

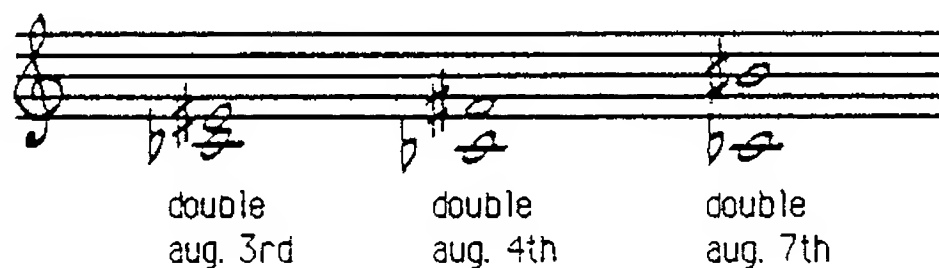
Major and perfect intervals made larger by a 1/2 step are called **augmented** intervals:



Diminished intervals made smaller by an additional half-step become **double diminished**:



Augmented intervals made larger by an additional half-step become **double augmented**:



It is also possible to have an interval which exceeds the octave:

This interval is called a

**major 10th**

(or a major 3rd plus 1 octave).



\*\*\*\*\*  
\*\*\*\*\*

Here are the basic rules and names (when examining the distance from the first note of a major scale upwards):

- 1) 2nds, 3rds, 6ths and 7ths are major intervals.
- 2) Unisons, 4ths, 5ths and octaves are perfect intervals.
- 3) Major intervals made smaller by 1/2 step become minor.
- 4) Major intervals made smaller by 2 half-steps become diminished.
- 5) Perfect intervals made smaller by 1/2 step become diminished.
- 6) Perfect intervals made smaller by 2 half-steps become double-diminished.
- 7) Major or perfect intervals made larger by 1/2 step are augmented; by two half-steps they become double augmented.

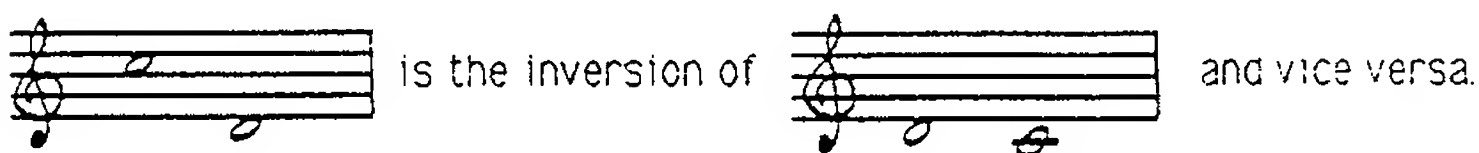
Homework numbers: 12, 13.

## INVERSION OF INTERVALS

Intervals describe the distance between two notes. The notes involved can appear and sound in two ways:



In other words, any interval can be turned upside-down (inverted).



When an interval is inverted, the note names involved are still the same, and the intervallic relationship follows a pattern. In the above example, one interval is a major 2nd; the inversion is a minor 7th. Some simple rules for inversion of intervals follow:

- 1) "9" minus the number of the interval equals the inversion interval:



$$9 \text{ minus } 2(\text{nd}) = 7(\text{th}) \quad \text{or:} \quad 9 \text{ minus } 7(\text{th}) = 2(\text{nd})$$

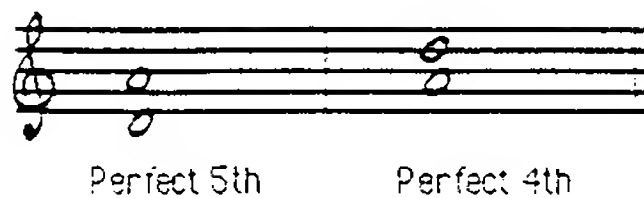
- 2) Major intervals inverted become minor intervals:



- 3) Minor intervals inverted become Major:



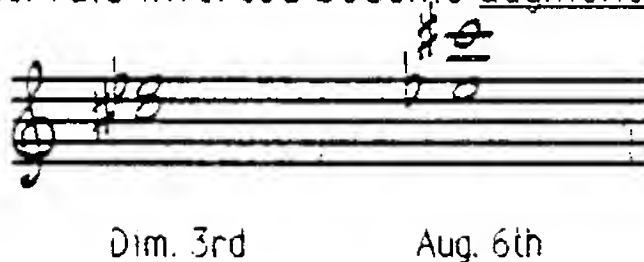
4) Perfect intervals inverted remain perfect.



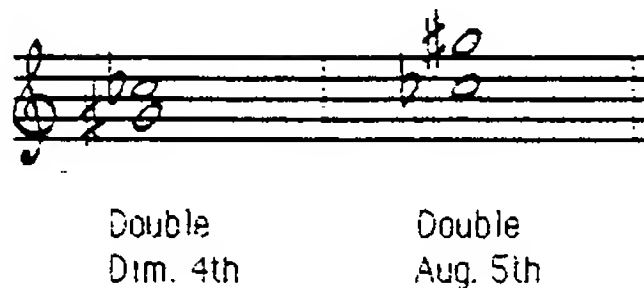
5) Augmented intervals inverted become diminished:



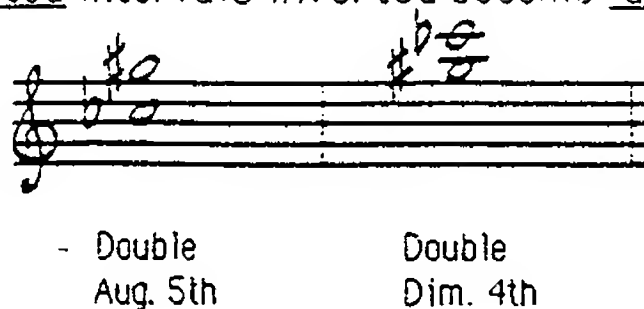
6) Diminished intervals inverted become augmented:



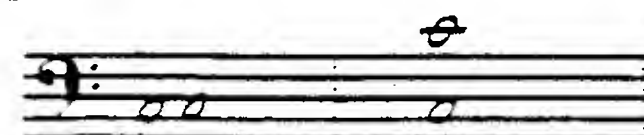
7) Double diminished intervals inverted become double augmented:



8) Double augmented intervals inverted become double diminished:



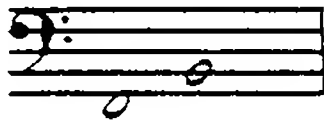
In order to correctly produce an inversion of any interval, the bottom pitch must be raised one octave or the top pitch must be lowered one octave. The inversion of a perfect unison becomes a perfect octave and vice versa:



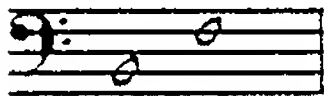
$$9 \text{ minus } 1 (\text{unison}) = 8 (\text{octave})$$



The **tritone** interval (augmented 4th) is a special case. Unlike any other interval, when it is inverted, the number and qualifier change, but it remains a tritone.



is an augmented 4th (tritone - 3 whole steps)



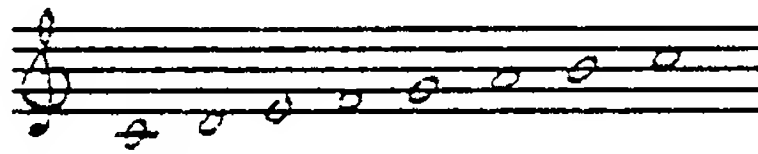
is a diminished 5th (still tritone - 3 whole steps)

Homework number: 14.

CHORD CONSTRUCTIONTRIADS

We have looked at notes alone in scale situations and two notes together in interval situations. Now, we will place three notes together to form a chord. The terms used to describe three note chords will be the same as before: **major, minor, augmented, and diminished** ("Perfect" is used only with intervals).

Three note chords are called triads. The basic building block for triads is the interval of a 3rd. To start with, the major scale will be used:



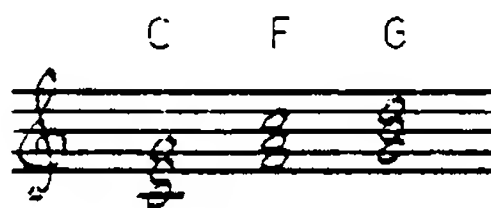
Above each note in the scale will be placed two more pitches – the first pitch a 3rd above the note from the scale, the second pitch a 3rd above the second pitch:



All the pitches used to build the chords are from the key of C major. They are **diatonic** to C major.

The **diatonic triads** in the key of C major contain three of the four possible triadic chord structures (major, minor, and diminished). If the intervallic relationships within each chord are studied, these three chord types and their characteristics can be seen:

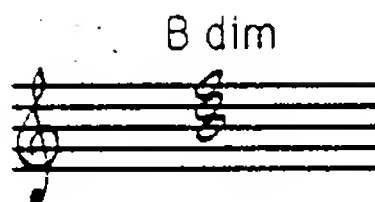
- 1) Major triads: chords with intervals of a major 3rd from the **root** (bottom note) to the middle note, and a perfect 5th from the root to the top note:



- 2) MINOR TRIADS: chords with intervals of a minor 3rd and perfect 5th from the root respectively:

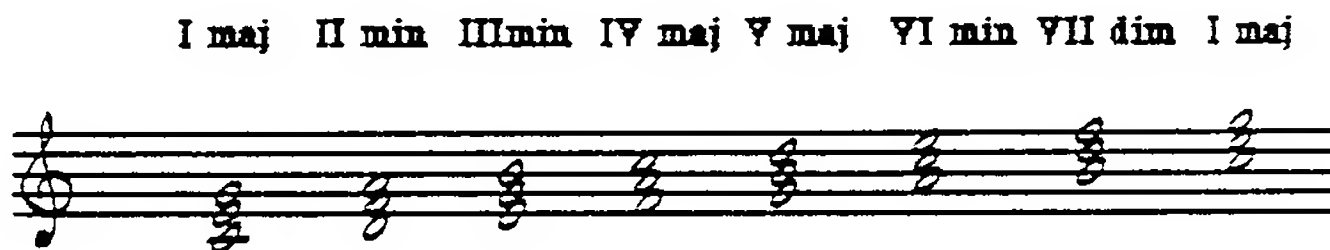


3) DIMINISHED TRIAD: a chord with an interval of a minor 3rd and diminished 5th, respectively:



Note that in all cases, the letter name of the triad signifies the bottom note. This note is called the **root** of the chord.

In addition, each chord will be identified with a Roman numeral representing the scale degree of the bottom pitch:



Here are some universally accepted abbreviations used for triads:

C = C major triad. Optionally "major" or its abbreviation "maj" may appear: i.e., C major or C maj.

"min" is the abbreviation for minor. Also used, though not universally, is the minus sign "-" (which will remain the choice for this course).

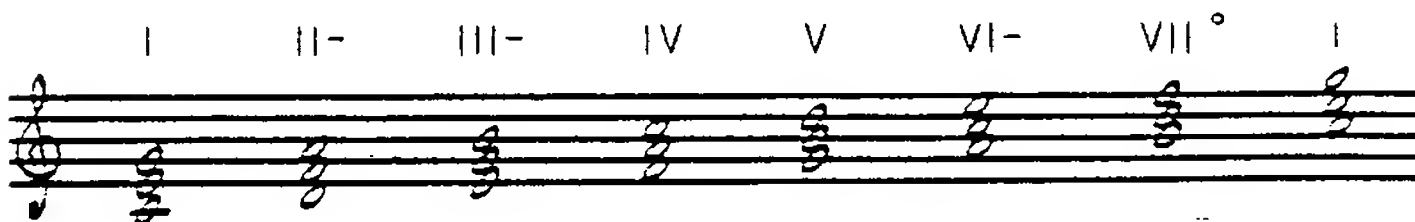
"A minor" will be notated in this course "A-."

Diminished is represented best by "dim" or a small circle above the triad name, i.e.; B dim or B<sup>o</sup>

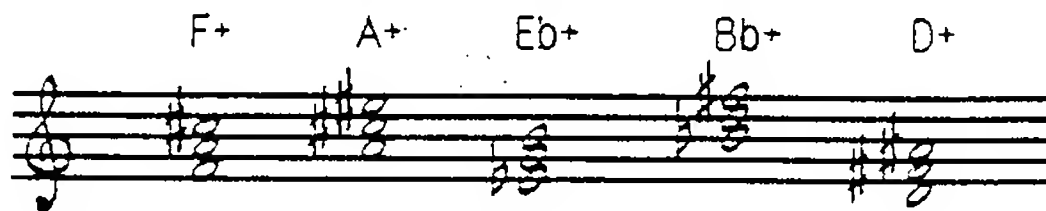
The diatonic triads are:

I maj II min III min IV maj V maj VI min VII dim I maj

OR:

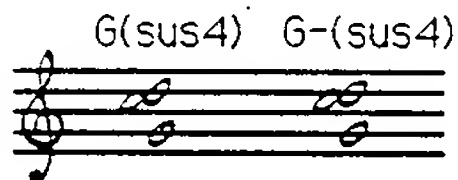


The fourth type of triad, besides major, minor and diminished, is the **augmented** triad. It is abbreviated either "aug" or "+" . The augmented triad has a major 3rd and an augmented 5th from the root:



The augmented triad is not diatonic to any major key. Its usage will be discussed later.

There is one more type of chord. It is a very common chord in contemporary music, and it doesn't fit the normal pattern of stacked thirds. It is the "**suspended 4th**" chord. The chord symbol used is **sus4**. A suspended fourth chord (sus4) is a triad in which the 4th degree replaces the 3rd degree:



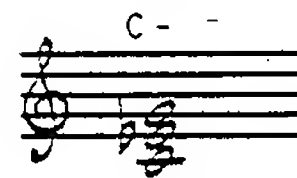
\*\*\*\*\*  
\*\*\*\*\*

To summarize;

Major triads are constructed with major 3rds and perfect 5ths from the root:



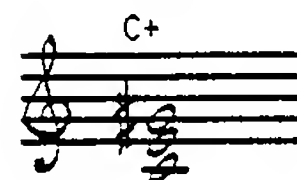
Minor triads are constructed with minor 3rds and perfect 5ths from the root:



Diminished triads are constructed with minor 3rds and diminished 5ths from the root:



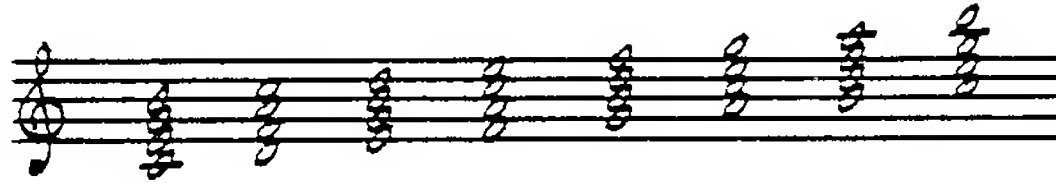
Augmented triads are constructed with major 3rds and augmented 5ths from the root:



Homework number: 15.

CHORD CONSTRUCTION (CONT'D)SEVENTH CHORDS

The logical extension of a diatonic triad is the addition of another diatonic third above the fifth of the triad.



The result is a diatonic **seventh chord** which contains a diatonic 7th degree above the root. In triads there are only three intervallic relationships: root to 3rd, root to 5th and 3rd to 5th. With the added pitch of 7th chords, the complexity doubles: root to 3rd, 5th, 7th; 3rd to 5th, 7th; 5th to 7th. Thus, 7th chords are more complex than triads.

Chords with a major 3rd, perfect 5th and major 7th from the root define a:

Cmaj7    Fmaj7

major 7th  
chord

Chords with a minor 3rd, perfect 5th and minor 7th from the root define a:

D-7    E-7    A-7

minor 7th  
chord

A chord with a major 3rd, perfect 5th and minor 7th from the root defines a:

G7

dominant 7th  
chord

A chord with a minor 3rd, diminished 5th and minor 7th from the root defines a:

B-7(b5)

minor 7(b5)  
chord

It helps to compare these seventh chords with the triads on which they are built:

The chords built on C and F are major triads with major 7ths:



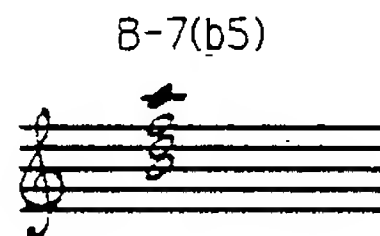
The chords built on D, E and A are minor triads with minor 7ths:



The chord built on G is a major triad with a minor 7th:



The chord built on B is a diminished triad with a minor 7th:



The chord symbols for seventh chords which will be used in this course are:

<b>maj 7</b> = major triad w/major 7th	<b>7</b> = major triad w/minor 7th
<b>-7</b> = minor triad w/minor 7th	<b>-7(b5)</b> = dim. triad w/minor 7th

The diatonic triads in C major are:

I maj7	II-7	III-7	IV maj7	V7	VI-7	VII-7(b5)
C maj7	D-7	E-7	F maj7	G7	A-7	B-7(b5)

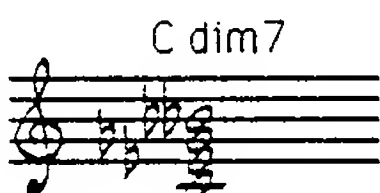


There are other 7th chord structures which are not diatonic to a major key:

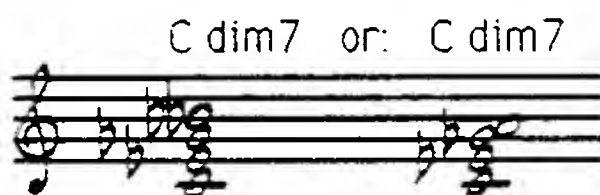
The **+7 (augmented 7th chord)** which consists of an augmented triad with a minor 7th:



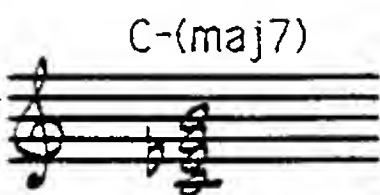
The **°7 (diminished 7th chord)** which consists of a diminished triad with a diminished 7th:



Note: in the diminished 7th chord, the diminished seventh interval is sometimes written enharmonically.



The **minor/major 7th chord** [symbol: **-(maj7)**] which consists of a minor triad with a major 7th:

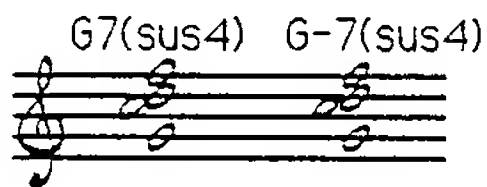


Notice in the chord symbol, the "-" represents the basic chord sound (minor) while the "(maj7th)" indicates the 7th quality. The parenthesis is necessary to keep minor and major from being confused.

The **major 6th** chord and the **-6** (minor 6th) chord which consist of a major or minor triad respectively and an "added" 6th degree:



The dominant 7(sus4) chord which consists of a suspended 4th triad with a minor 7th:



Homework number: 16.

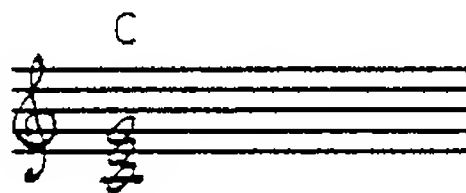


INVERSION OF CHORDS

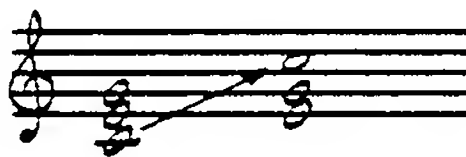
The basic rule for inverting triads is the same as that for intervals: bring the bottom pitch up an octave. There are as many positions of inversion for a triad as there are notes in the chord (i.e. three in a triad).



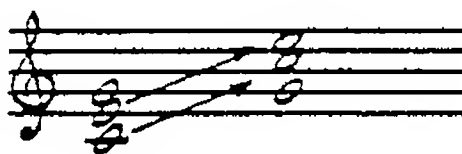
If the root is positioned on the bottom (where it would normally be for naming purposes) the chord is in **root position**:



The **first inversion** is accomplished by bringing the root up an octave:



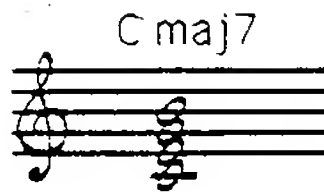
The **second inversion** is accomplished by bringing the root and the 3rd up an octave:



One more inversion would bring the chord back to root position. Notice that there are three possible choices for the top note of any triad.

Since seventh chords contain four notes, there are four positions of inversion possible:

1. **Root position:**



2. **1st inversion** with the root on top and the 3rd on the bottom.



3. **2nd inversion** with the root and 3rd brought to the top and the 5th on the bottom:



4. **3rd inversion** with the root, 3rd and 5th brought to the top and the 7th on the bottom:



Homework numbers: 17, 18, 19, 20.

TENSIONS

Consideration is now given to further extensions of the 7th chord:



Chords larger than 7ths exceed an octave and create intervallic relationships which are much more tense than the simple octave-or-less intervals of triads and 7ths.

No matter what the inversion is, all the intervals in a triad or 7th chord are less than an octave in size.



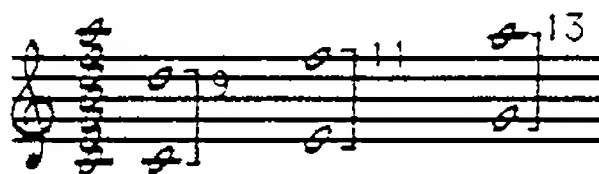
Extend a 7th chord in 3rds as far as possible without repeating pitches:



There are now 21 intervals in this chord! A 7th chord in root position has 6, a triad 3. The number of intervals has more than tripled from those of the 7th chord, while the 7th chord has only twice as many as the triad. In addition to the intervals which are less than one octave, there are now **compound intervals** (the 9, 11th and 13th). Some facts about these extended 7th chords should be recognized:

1. The added pitches are not chord tones of the 7th chords;
2. They create tense intervallic relationships with the chord tones.

Because of this tense relationship with the chord tones of the 7th chord, these extensions are called **tensions**. 1, 3, 5 and 7 are the **chord tones**; 9, 11 and 13 form the basis for the chord's possible tensions. Here is a C maj7 chord with its possible tensions:

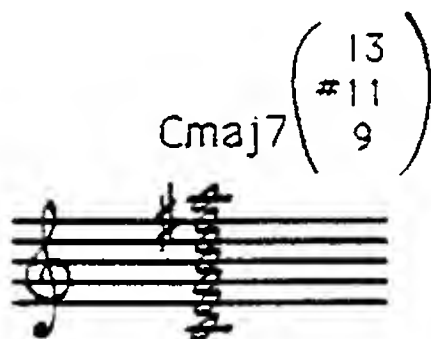


The 9th (D) is a major 9th above the root; the 11th (F) is a minor 9th above the 3rd; the 13th (A) is a major 9th above the 5th. The tensions which sound best will be those a major 9th above a chord tone. (A minor 9th interval is extremely harsh sounding.) In the following examples all tensions are those a major 9th above the chord tones:



Note that the "F" has been sharpened in order to create the major 9th interval.

The 13th (A) is a major 9th above the 5th;  $\sharp 11$  (F $\sharp$ ) is a major 9th above the 3rd; 9 (D) is a major 9th above the root. Notice that tension  $\sharp 11$  is not identified as "augmented 11." Tensions are labeled as follows:



The chart of available tensions for all chord changes is on the following page. Most of the available tensions are those which are a major 9th above a chord tone. Any available tensions that are not a major 9th above a chord tone are listed separately as exceptions.

Maj7 is included in the list as a special tension situation available on certain chord structures.

AVAILABLE TENSIONS

CHORD	AVAILABLE TENSIONS	AVAILABLE TENSIONS WHEN DIATONIC TO KEY	EXCEPTIONS TO THE "MAJ 9TH ABOVE A CHORD" TONE RULE
maj (triad)	9		
min (triad)		9	
aug (triad)	9, *11 (or b5)		
dim (triad)	All available tensions must be a maj 9th above each chord tone and diatonic to the key.		
sus4 (triad)	11 (as chord tone)	9	
maj 6	maj7, 9	*11	
min 6	maj7, 9, 11		
maj 7	maj7 (as chord tone) 9, 13	*11	
min (maj 7)	maj7 (as chord tone) 9, 11, 13		
min 7	11	9	13 not available except in Dorian mode context
min 7(b5)	11, b13	9	
dom 7		9, *11, 13	b9, *9, b5(see note 1), b13
dom 7 (sus4)	9, 11(as chord tone), 13		very rarely: b9, *9, b13
aug 7	9, *11 (or b5)		
dim 7	All available tensions must be a maj 9th above each chord tone and diatonic to the key. ←		

Note 1 - b5 is a special tension situation involving an alteration of the 5th.

Note 2 - The available tensions on dim 7th chords are not numbered 9, 11, 13, etc. Unlike other 7th chords, a major or minor 9th above each chord tone results in four possible tensions, not three. The numbering system to 13 will not work here. Specific available tensions for dim 7ths will be shown when the chords are shown in context.

\*\*\*\*\*  
 \*\*\*\*\*

### Summary of Available Tensions

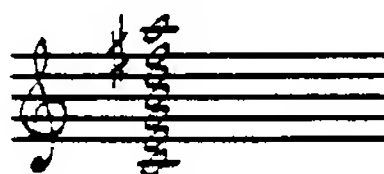
<u>Tension:</u>	<u>Available on:</u>
maj 7	maj7; -(maj7); maj6; -6
9	All chords (when diatonic to the key)
b9 and/or #9	dom7; rarely, dom7(sus4)
11	all forms of minor chords; as a chord tone on dom7(sus4)
#11	maj7 and maj6 when diatonic to key; dom7; +7
b13	-7(b5); dom7
13	maj7; -(maj7); dom 7; dom7(sus4)

Chord symbols used to show tensions fall into two categories:

- 1) The listing of tensions which are not diatonic; ○
- 2) The optional "courtesy" listing of tensions which are diatonic. ○

Tensions which would not normally be available MUST be included in the chord symbol:

C maj7(#11)



C maj7 in C major implies only 9 and 13 availability. C maj7(#11) would indicate use of a non-diatonic tension.

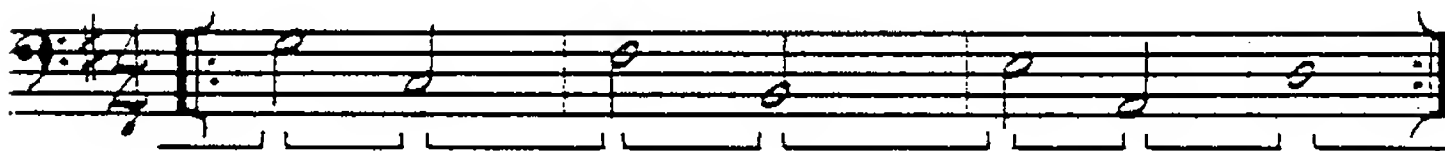
Homework numbers: 21, 22.

DIATONIC HARMONY

Any diatonic chord may progress to any other diatonic chord. The control factor is the relationship between the roots of the chords. This is called **root motion** and falls into three categories:

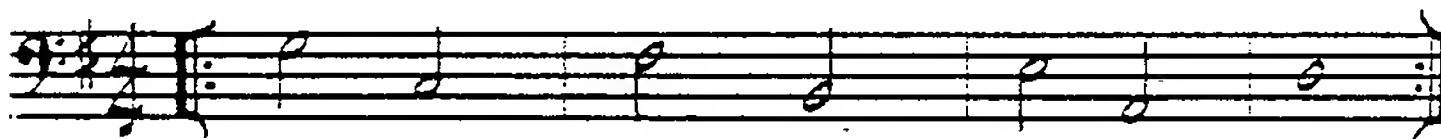
- 1) The strongest diatonic root motion is movement **down** in 5ths (the cycle of 5ths).

I maj7	IV maj7	VII-7(b5)	III-7	VI-7	II-7	V7
G maj7	C maj7	F#-7(b5)	B-7	E-7	A-7	D7



The tensions available are determined by the function of the chord in the key, the tensions that are diatonic to the key and the tensions that are a major 9th above a chord tone.

I maj7	IV maj7	VII-7(b5)	III-7	VI-7	II-7	V7
--------	---------	-----------	-------	------	------	----



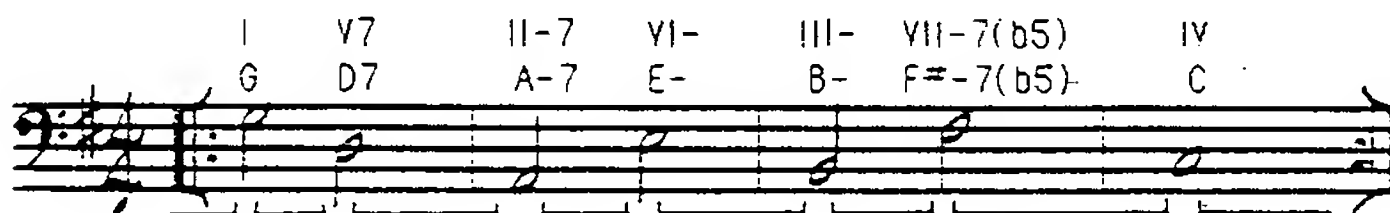
TENSIONS:  $\begin{pmatrix} 13 \\ 9 \end{pmatrix}$   $\begin{pmatrix} 13 \\ \#11 \\ 9 \end{pmatrix}$   $\begin{pmatrix} b13 \\ 11 \end{pmatrix}$   $\begin{pmatrix} 11 \end{pmatrix}$   $\begin{pmatrix} 11 \\ 9 \end{pmatrix}$   $\begin{pmatrix} 11 \\ 9 \end{pmatrix}$   $\begin{pmatrix} 13 \\ 9 \end{pmatrix}$

V7 to I is the strongest diatonic root motion in the key, therefore it receives a special analysis symbol:

V7  $\curvearrowright$  I

The arrow will always be used to show dominant resolution down a perfect fifth.

- 2) Root motion down a diatonic 4th is also strong although not as strong as root motion down a diatonic 5th.



TENSIONS:  $\begin{pmatrix} 9 \end{pmatrix}$   $\begin{pmatrix} 13 \\ 9 \end{pmatrix}$   $\begin{pmatrix} 11 \\ 9 \end{pmatrix}$   $\begin{pmatrix} 9 \end{pmatrix}$   $\begin{pmatrix} b13 \\ 11 \end{pmatrix}$   $\begin{pmatrix} 9 \end{pmatrix}$

- 3) Stepwise root motion is a little more subtle than root motion of 4ths and 5ths.

Diagram illustrating stepwise root motion in G major. The sequence of chords and their roots is: I (G), II- (A-), III- (B-), IV- (C), III- (B-), II- (A-), I (G), IV (C), V(sus4) (D7(sus4)), VI- (E-), and V7 (D7). The roots move stepwise: G, A, B, C, B, A, G, C, D, E, D. The notation includes a treble clef, a key signature of one sharp (F#), and a common time signature (C). Brackets are placed under the notes to show the stepwise movement of the roots.

- 4) The other diatonic root motion is down or up in thirds. Movement down is more common than movement up.

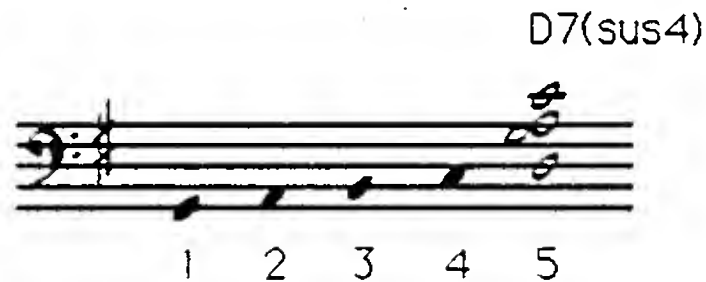
Diagram illustrating root motion in thirds in G major. The sequence of chords and their roots is: I (G), VI- (E-), IV (C), II- (A-), I (G), III- (B-), II- (A-), IV (C), VI- (E-), and V(sus4) (D(sus4)). The roots move in thirds: G, E, C, A, G, B, A, C, E, D. The notation includes a treble clef, a key signature of one sharp (F#), and a common time signature (C). Brackets are placed under the notes to show the third intervals between roots.

In reviewing all of the previous examples, take note that they are repeated. If an ending point is sought, the best final chord will be the I chord. The I chord may be followed by any other chord because it represents a point of harmonic arrival.



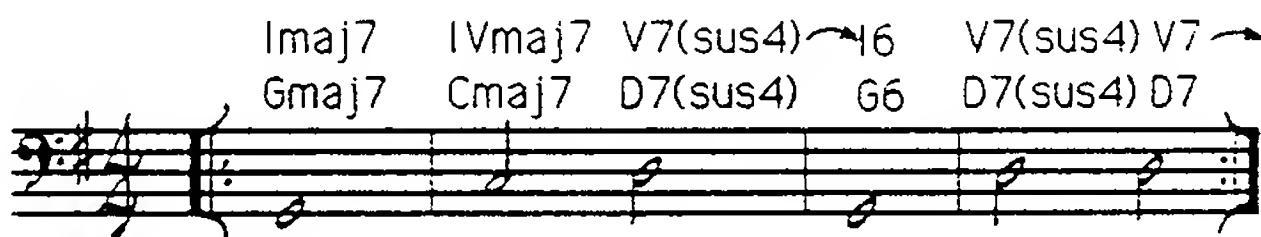
V7 (SUS 4) CHORDS

The V7(sus4) chord is usually built on the dominant degree of the key:

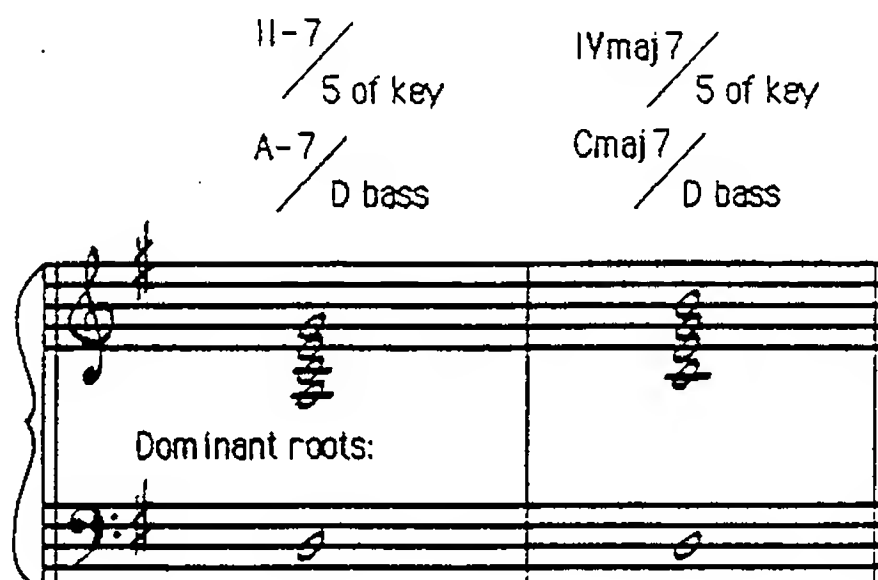


The strength of dominant resolution lies in the root motion of a perfect 5th down.

Since the V7(sus4) does not contain a tritone, its diatonic function is dependent on context:



Another observation concerning the V7(sus4) chord can be seen if the structure is categorized as having a subdominant upper structure (since the tritone is not present). The chords sound subdominant but the root is dominant:



The above two chords each contain a subdominant sounding upper structure and the dominant degree of the key as their root.

These chords are common in contemporary tunes:

II-7 / 5 of key      I      IV      IVmaj7 / 5 of key      I

A-7 / D bass      G(add9)      C      Cmaj7 / D bass      G(add9)

II-7 over 5 of the key and IVmaj7 over 5 of the key are both subtle versions of V7(sus4) and should be analyzed as such:

V7(sus4)      I      IV      V7(sus4)      I

A-7 / D bass      G(add9)      C      Cmaj7 / D bass      G(add9)



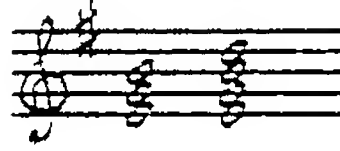
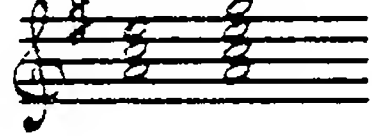
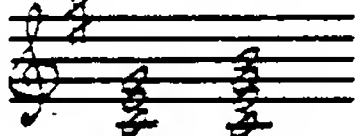
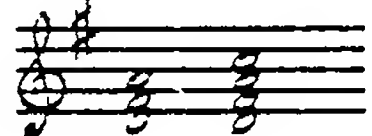
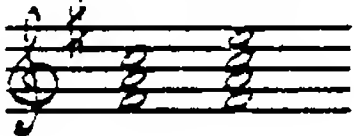
The II- (II-7) over 5 of the key and the IV (IVmaj7) over 5 of the key can be seen as chord structures derived from the extended structure of the V7(sus4):

A- / D      A-7 / D      C / D      Cmaj7 / D      D7(sus4), 11, 13

# DIATONIC REHARMONIZATION

Diatonic chords have names based on the location of their roots within the scale. The I chord is called **tonic**; the V chord is **dominant**; the IV chord is called **subdominant**.

All diatonic chords can be categorized as sounding in one of the three categories:

Tonic:	I (triad) Imaj7	III- III-7	VI- VI-7
			
Subdominant:	II- II-7	IV (triad) IVmaj7	
			
Dominant:	V (triad) V7	VII dim VII-7(b5)	
			

(T) I G      (SD) IV6 C5      (SD/D) V7(sus4) D7(sus4)      (T) I G      (SD/D) V7(sus4) D7(sus4)      (D) V7 D7

(T) = TONIC (SD) = SUBDOMINANT (D) = DOMINANT (SD/D) = Dominant root with subdominant upper structure

By substituting other chords from the same functional sound category, it is possible to **reharmonize** the above example. The end result will be a new chord progression which sounds similar to the original.

(T) III-7 B-7      (T) VI-7 E-7      (SD) II-7 A-7      (D) V7 D7      (T) VI-7 E-7      (T) I6 G6      (SD) IV6 C5      (SD/D) V7(sus4) D7(sus4)

In comparing these two progressions, some important facts must be considered:

- 1) the root motions are not the same, though the melodies are;
- 2) the melody and reharmonization choices must be compatible;
- 3) the original resolutions of the two dominant chords are no longer down a perfect fifth (the normal expected resolution for V7 or V7(sus4) is down a perfect fifth to the I chord).

V7 $\curvearrowright$ I		V7(sus4) $\curvearrowright$ I		V7 / I	VI-7	V7(sus4) / I	III-7
D7	G	D7(sus4)	G	D7	E-7	D7(sus4)	B-7

Notice that the analysis symbols for the "deceptive" resolutions of V7 to III-7 or VI-7 are different from those for the resolution of V7 to I. The root motion is not down a perfect fifth, so there is no arrow. The analysis symbol is: V7/I. V7/I means V7 of I; V7 is expected to progress to I, but resolves deceptively (**deceptive resolution**) to another tonic chord.

## CADENCE

The term **cadence** means melodic and/or harmonic movement to a point of rest. That point of rest is the cadence.

### Dominant cadence:

Diagram illustrating a Dominant Cadence progression in B major:

Chord sequence: B: I (Bmaj7) → G: V7 (D7) → B: I (Bmaj7) → Eb: V7 (Bb7) → Eb: I (Ebmaj7) → B: V7 (F#7) → B: I (Bmaj7).

Functional groups: T (Tonic), D (Dominant), T (Tonic), D (Dominant), T (Tonic), D (Dominant), T (Tonic).

### Subdominant cadence:

Diagram illustrating a Subdominant Cadence progression in F major:

Chord sequence: F: I (F) → F: IV (Bb) → F: I (F) → Bb: I (Bb) → Bb: IV (Eb) → Bb: I (Bb) → C: I (C) → C: IV (F) → C: I (C) → F: I (F) → F: IV (Bb) → F: I (F).

Functional groups: T (Tonic), SD (Subdominant), T (Tonic), T (Tonic), SD (Subdominant), T (Tonic), T (Tonic), SD (Subdominant), T (Tonic), T (Tonic), SD (Subdominant), T (Tonic).

A subdominant to dominant to tonic progression is considered a **full cadence** since all the functional sound groups of the key are represented: IV to V to I is the traditional full cadence.

Diagram illustrating a Full Cadence progression in C major:

Chord sequence: SD (IV, C) → D (V, D) → T (I, G).

Functional groups: SD (Subdominant), D (Dominant), T (Tonic).

Other cadential variations are possible:

IV to V(sus4) to I is subtle since there is no tritone involved:

IV      V(sus4)      I  
C      D(sus4)      G

IV to IV/dominant root to I is even more subtle because the motion from the subdominant to dominant only involves root motion from IV to V of the key:

IV      V7(sus4)      I  
C      C/D      G

The II-7 to V7 to I cadence is very strong since all the root motion is down in perfect 5ths. This particular variation of the full cadence is so strong that some styles of contemporary music rely on it almost exclusively:

G: II-7   V7   I maj7      F: II-7   V7   I maj7  
A-7   D7   Gmaj7      G-7   C7   Fmaj7

Bb: II-7   V7   I maj7      G: II-7   V7   I maj7  
C-7   F7   Bbmaj7      A-7   D7   Gmaj7





NAME \_\_\_\_\_

HARMONY I HOMEWORK 47

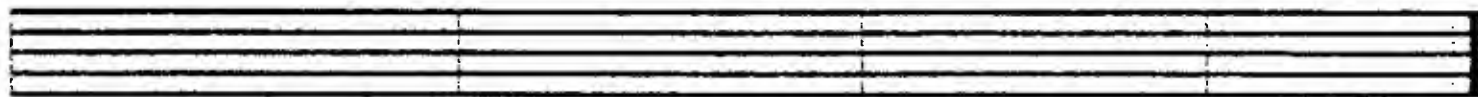
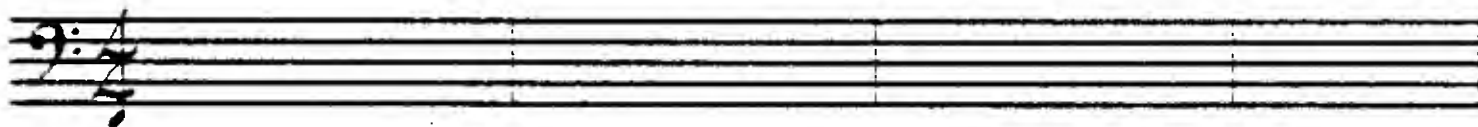
## HOMEWORK

1) Identify, by pitch name, all the following pitches.

NOTES:

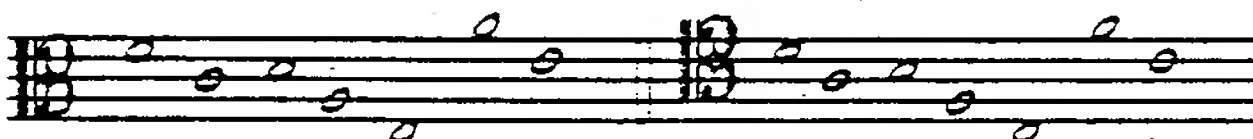


2) Notate the melody in ex.1, above, in the bass clef. Use ledger lines when necessary. Both examples should sound exactly the same on the piano.



3) Identify, by pitch name, all the following notes in **two** of the C clefs:

NOTE:



HARMONY I HOMEWORK 48

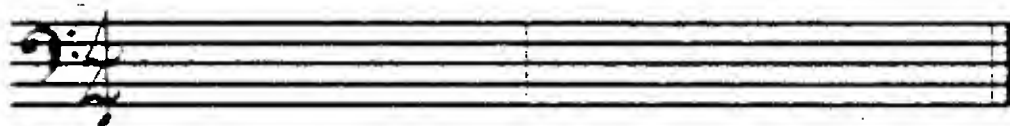
NAME \_\_\_\_\_

HARMONY I HOMEWORK 49

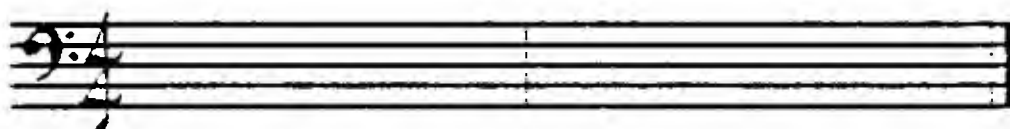
4) Write this short melody:



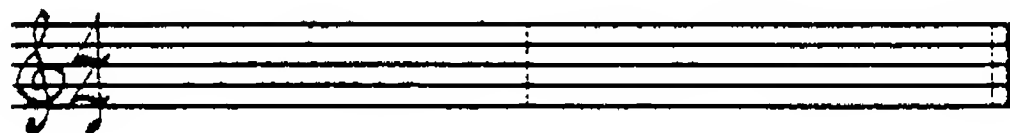
1. One octave BELOW:



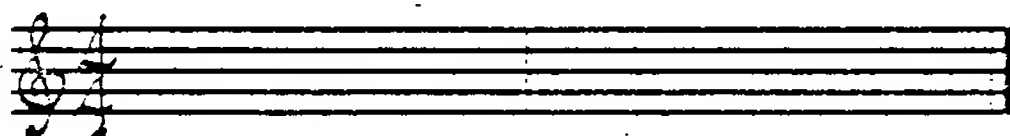
2. Two octaves BELOW:



3. One octave ABOVE:



4. Two octaves ABOVE:



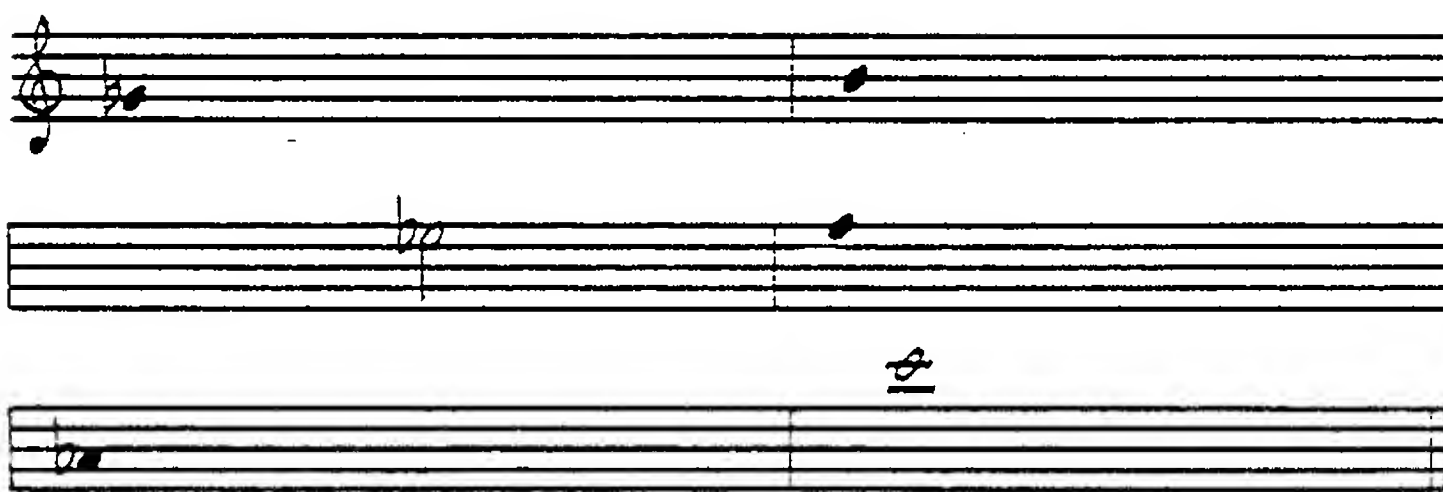
NAME \_\_\_\_\_

HARMONY I HOMEWORK 50

- 5) Notate chromatic motion between the given pitches. Observe the rules governing accidentals.



- 6) Rewrite the previous example 1/2 STEP HIGHER.

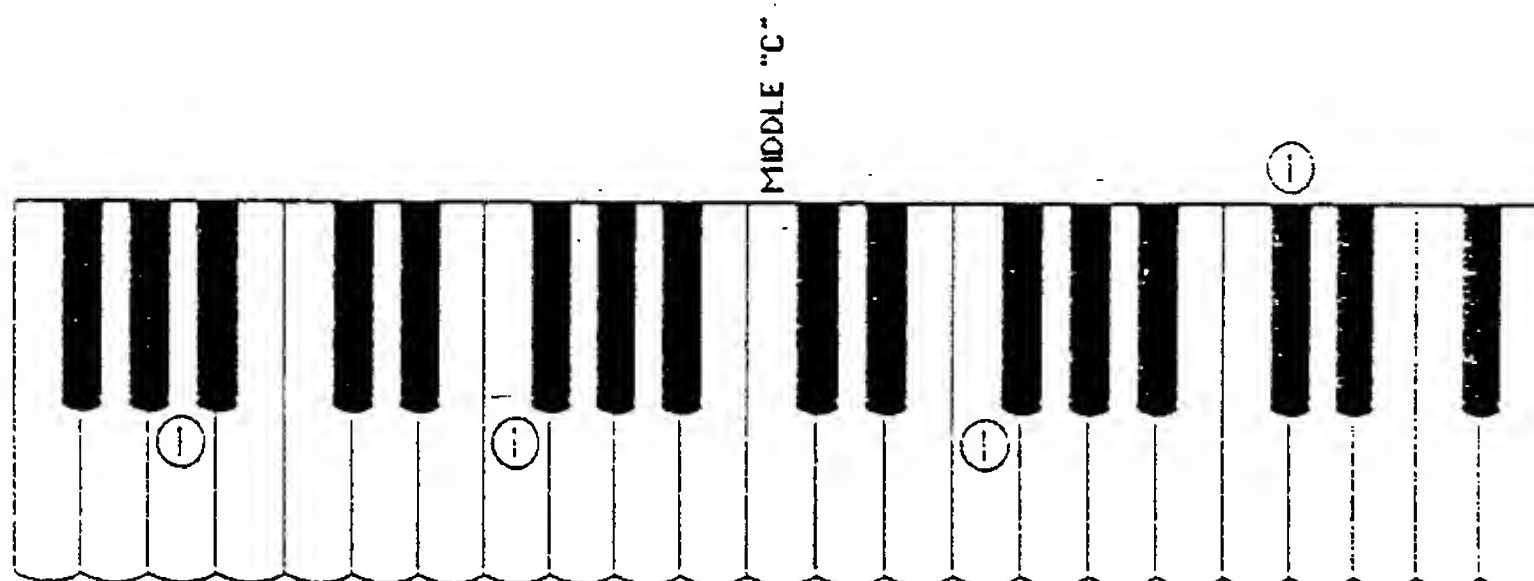


NAME \_\_\_\_\_

HARMONY I HOMEWORK 51

- 7) Identify by name all the pitches. Then, place the number for all notes of the chord on the appropriate key of the keyboard below. The first example is completed.

1 2 3 4 5 6 7 8 9 10



NAME \_\_\_\_\_

HARMONY I HOMEWORK 52

3) Complete the following enharmonic pitch chart:

Natural Notation:	Sharp Notation:	Flat Notation:	Double-sharp Notation:	Double-flat Notation:

NAME \_\_\_\_\_

HARMONY I HOMEWORK 53

9) Complete the following chart of major and minor scales. Indicate the 1/2 steps. Do not use enharmonic spelling. Do not mix sharps with flats.

Number of  
sharps or flats  
necessary for  
related major  
and minor:

MAJOR SCALE.

RELATED NATURAL MINOR

None

--	--

1#

--	--

B minor

--	--

A major

--	--

--	--

NAME \_\_\_\_\_

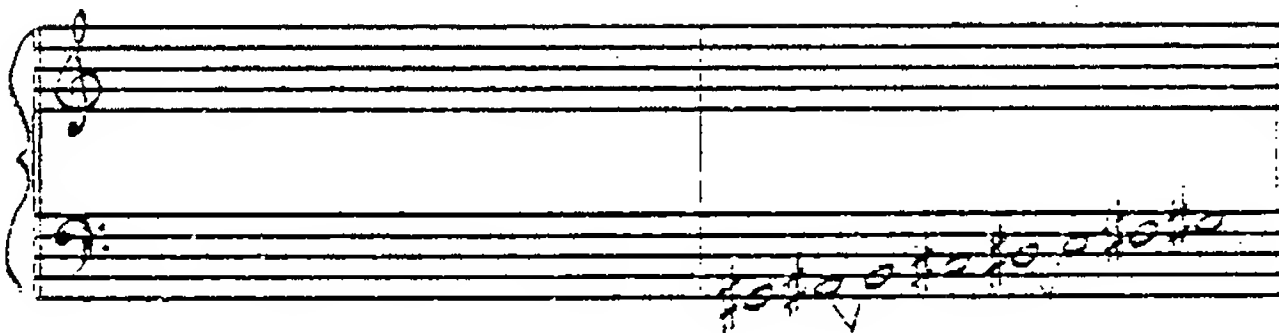
HARMONY I HOMEWORK #54

MAJOR SCALE


RELATED NATURAL MINOR

Number of  
sharps or flats.

\_\_\_\_\_

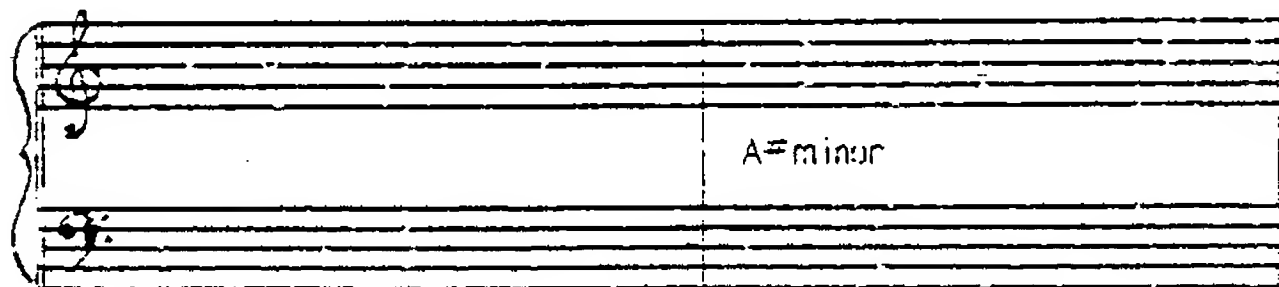


\_\_\_\_\_

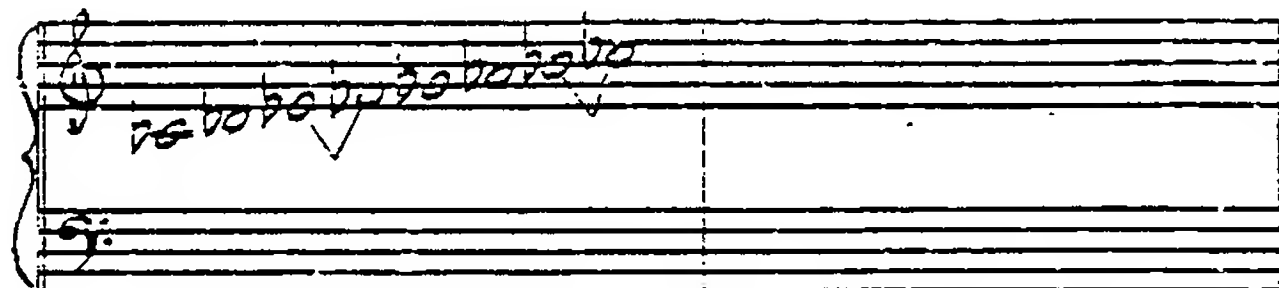


\_\_\_\_\_

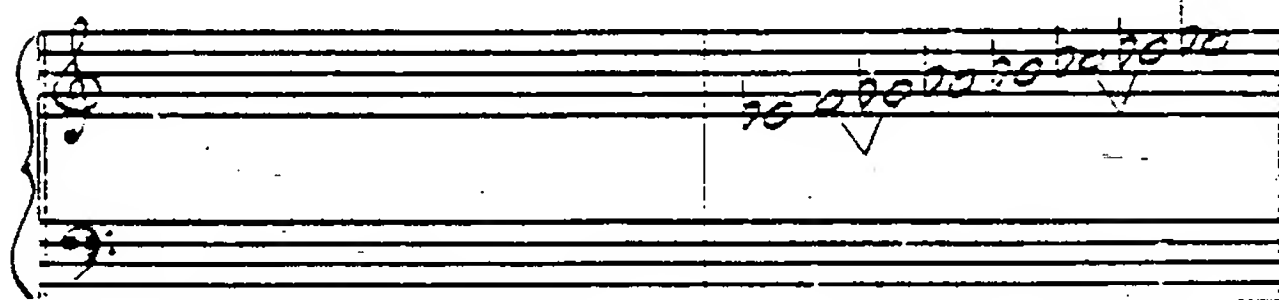
A=minor



\_\_\_\_\_



\_\_\_\_\_





NAME \_\_\_\_\_

HARMONY I HOMEWORK 55

MAJOR SCALE:

RELATED NATURAL MINOR:

Number of  
sharps or flats:

\_\_\_\_\_

\_\_\_\_\_

Ab major

\_\_\_\_\_

\_\_\_\_\_

G minor

\_\_\_\_\_

F major

NAME \_\_\_\_\_

HARMONY I HOMEWORK 56

10) Identify the following MODES:

F Dorian

\_\_\_\_\_

\_\_\_\_\_



\_\_\_\_\_

\_\_\_\_\_



\_\_\_\_\_

\_\_\_\_\_

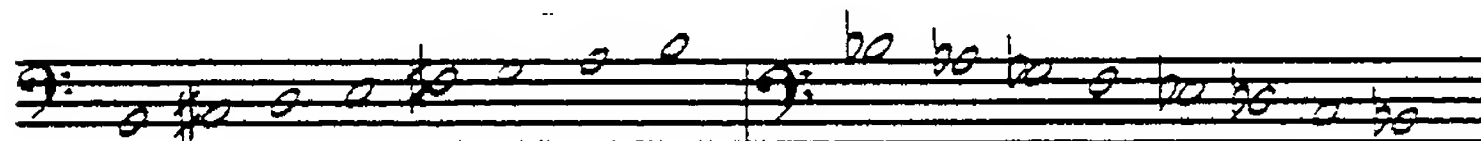


\_\_\_\_\_



\_\_\_\_\_

\_\_\_\_\_



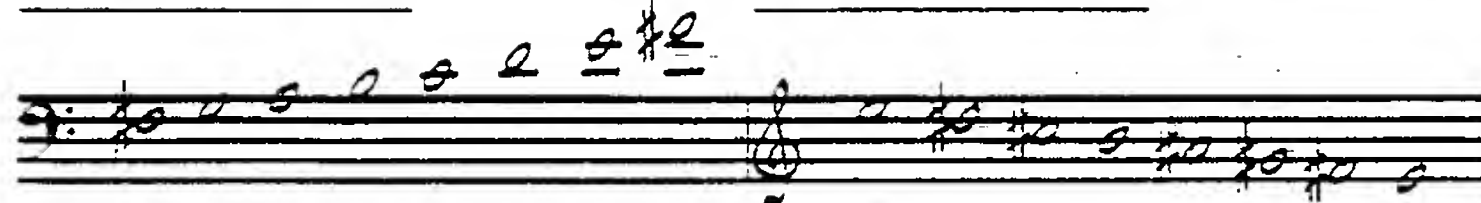
\_\_\_\_\_

\_\_\_\_\_



\_\_\_\_\_

\_\_\_\_\_



NAME \_\_\_\_\_

HARMONY I HOMEWORK 57

11) Write the key signatures for the following keys and identify the missing tonality:

G major

\_\_\_ major

D major

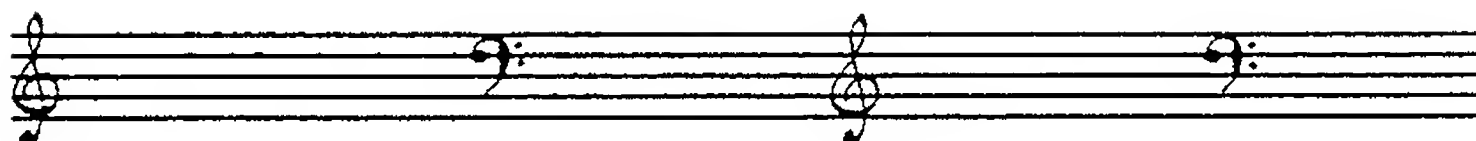
Bb major

\_\_\_ minor

D minor

\_\_\_ minor

\_\_\_ minor



\_\_\_ major

Eb major

\_\_\_ major

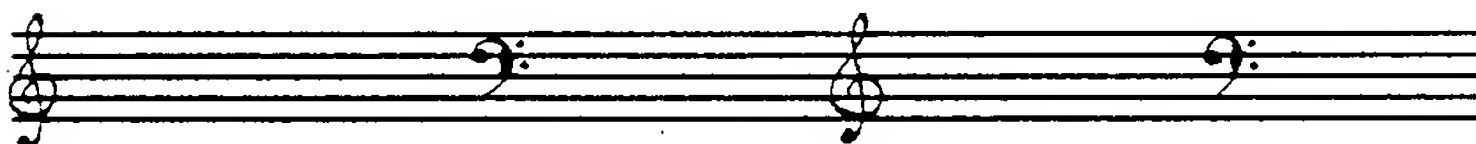
\_\_\_ major

F# minor

\_\_\_ minor

C# minor

F minor



\_\_\_ major

C major

\_\_\_ major

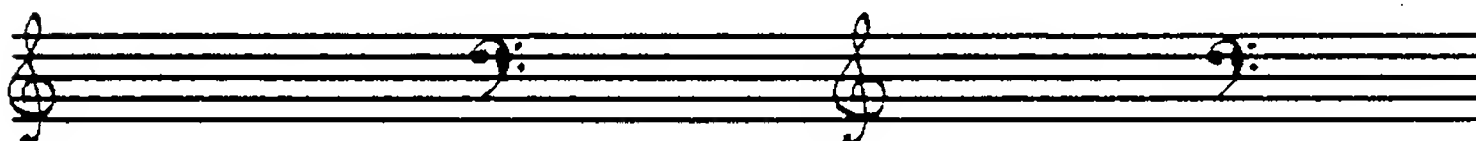
Cb major

A minor

\_\_\_ minor

A# minor

\_\_\_ minor



\_\_\_ major

Gb major

\_\_\_ major

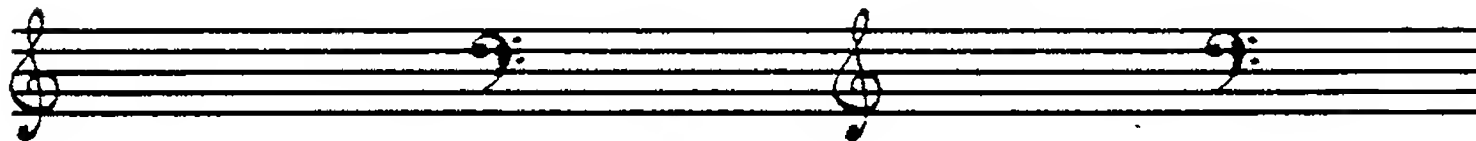
\_\_\_ major

D# minor

\_\_\_ minor

G# minor

Bb minor



HARMONY I HOMEWORK 58

NAME \_\_\_\_\_

HARMONY I HOMEWORK 59

12) Complete the following chart of intervals from the key of Eb. Keep the highest pitch diatonic. Use the appropriate accidentals.

Diatonic interval:	Diatonic interval reduced by 1/2 step:	Diatonic interval increased by 1/2 step:
min 2nd	dim 2nd	maj 2nd

NAME \_\_\_\_\_

HARMONY I HOMEWORK 60

Diatonic  
interval:

Diatonic interval  
reduced by  
1/2 step:

Diatonic interval  
increased by  
1/2 step:

NAME \_\_\_\_\_

HARMONY I HOMEWORK 61

Diatonic  
interval:

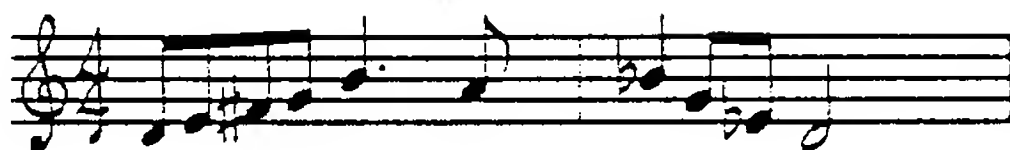
Diatonic interval  
reduced by  
1/2 step:

Diatonic interval  
increased by  
1/2 step:

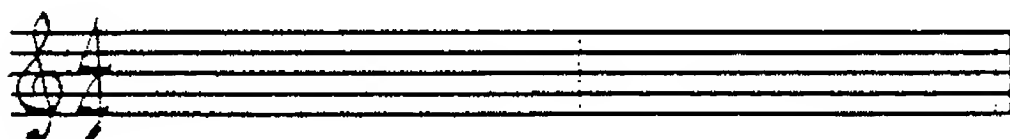
		
		
		
		
		
		
		
		
		
		

NAME \_\_\_\_\_

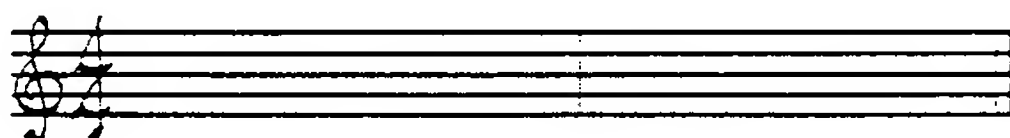
13) Rewrite this melody:



1) A major 2nd higher:



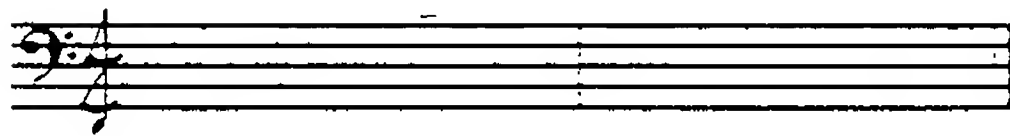
2) A major 6th higher:



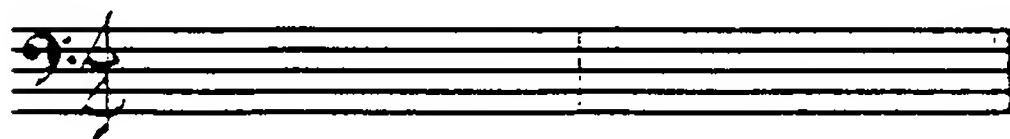
3) A major 9th lower (in bass clef):



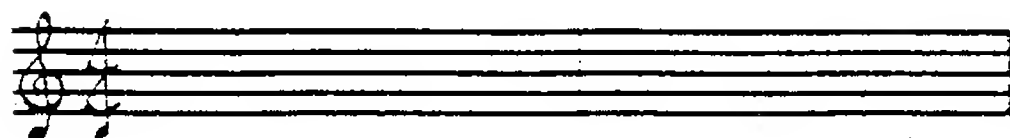
4) A major 13th lower:



5) A minor 3rd lower:



6) A perfect 4th higher:





NAME \_\_\_\_\_

HARMONY I HOMEWORK 63

14) Complete the following chart of intervals and their inversions diatonic to the key of G. Label the intervals:

Diatonic  
Interval:

Inversion of  
diatonic interval:

Diatonic  
Interval:

Inversion of  
diatonic interval:

min 2nd      maj 7th

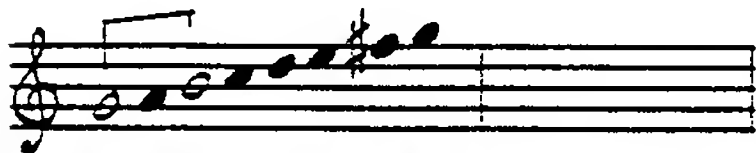
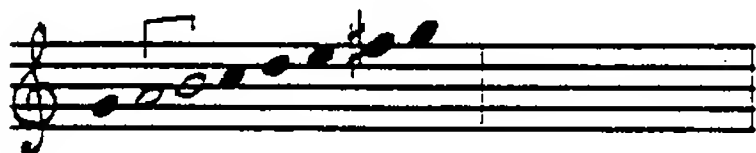
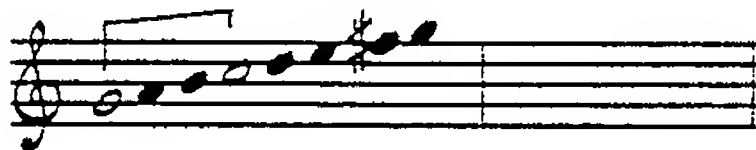
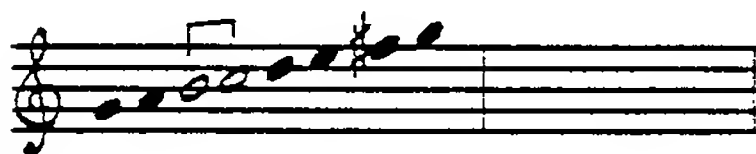
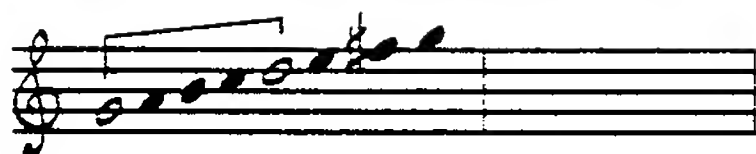
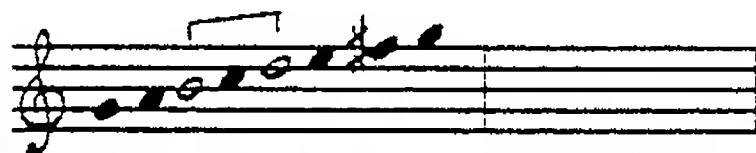
NAME \_\_\_\_\_

HARMONY I HOMEWORK 64

( Ex. 14 continued:)

Diatonic  
interval:

Inversion of  
diatonic interval:



NAME \_\_\_\_\_

HARMONY I HOMEWORK #5

15) Construct the indicated TRIADS in ROOT POSITION. Do not use enharmonic spelling.

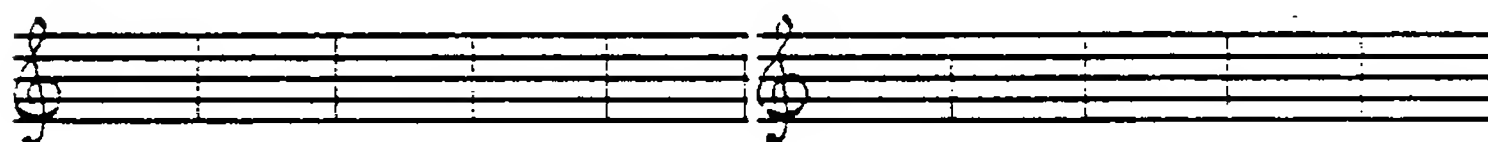
C      C-      C aug      C dim      C(sus4)      F      F-      F aug      F dim      F(sus4)



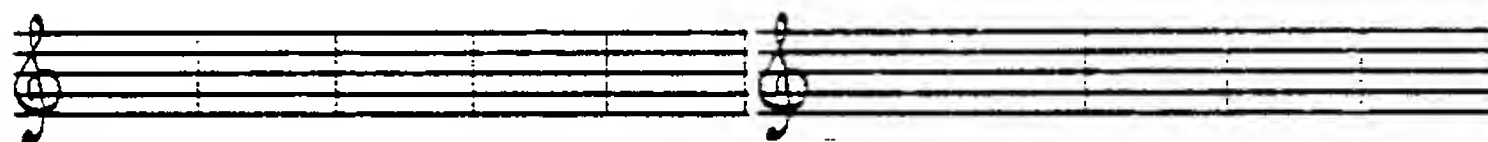
Bb      Bb-      Bb aug      Bb dim      Bb(sus4)      Eb      Eb-      Eb aug      Eb dim      Eb(sus4)



Ab      Ab-      Ab aug      Ab dim      Ab(sus4)      Db      Db-      Db aug      Db dim      Db(sus4)



Gb      Gb-      Gb aug      Gb dim      Gb(sus4)      Cb      Cb-      Cb aug      Cb dim      Cb(sus4)



F#      F#-      F# aug      F# dim      F#(sus4)      B      B-      B aug      B dim      B(sus4)



E      E-      E aug      E dim      E(sus4)      A      A-      A aug      A dim      A(sus4)



D      D-      D aug      D dim      D(sus4)      G      G-      G aug      G dim      G(sus4)



HARMONY I HOMEWORK 66

NAME \_\_\_\_\_

HARMONY I HOMEWORK 67

16) Construct the indicated SEVENTH CHORDS in root position:

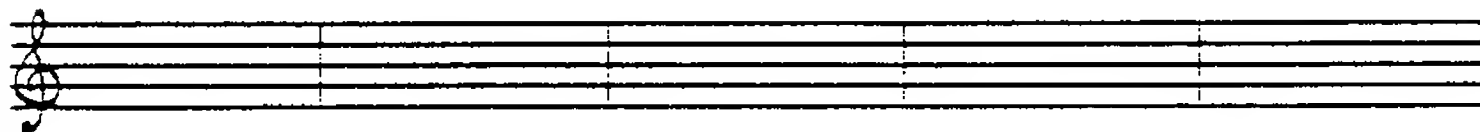
C maj7

C-(maj7)

C6

C-6

C-7



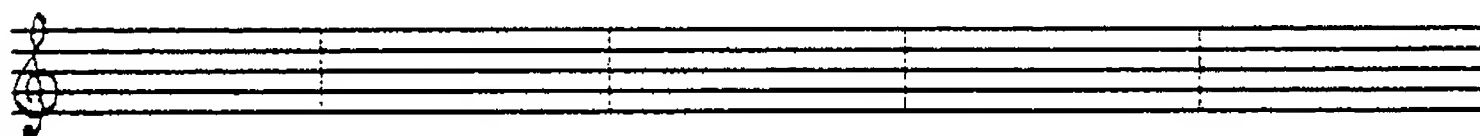
C-7(b5)

C7

C aug7

C7(sus4)

C dim7



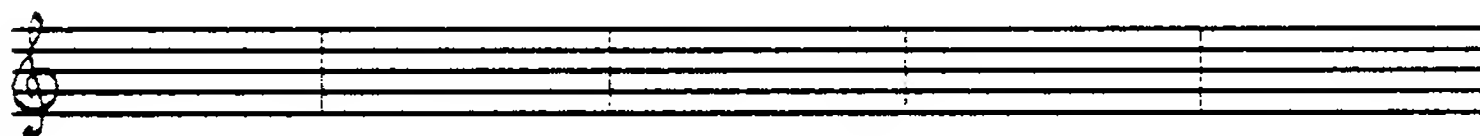
F maj7

F-(maj7)

F6

F-6

F-7



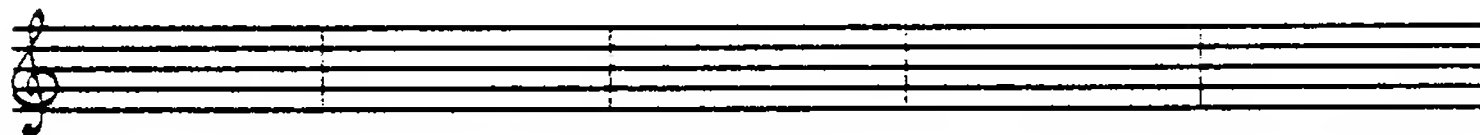
F-7(b5)

F7

F aug7

F7(sus4)

F dim7



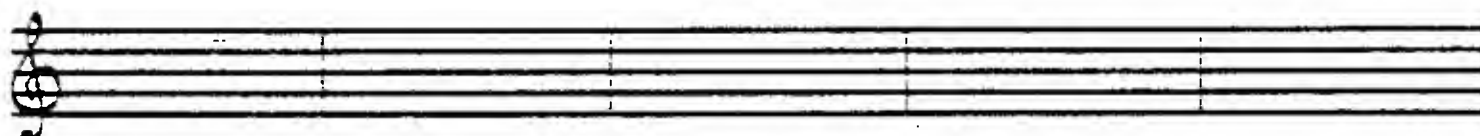
Bb maj7

Bb-(maj7)

Bb6

Bb-6

Bb-7



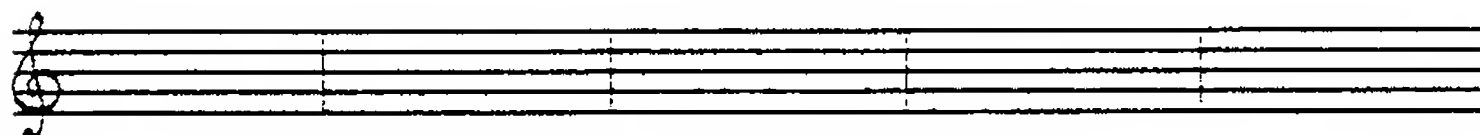
Bb-7(b5)

Bb7

Bb aug7

Bb7(sus4)

Bb dim7



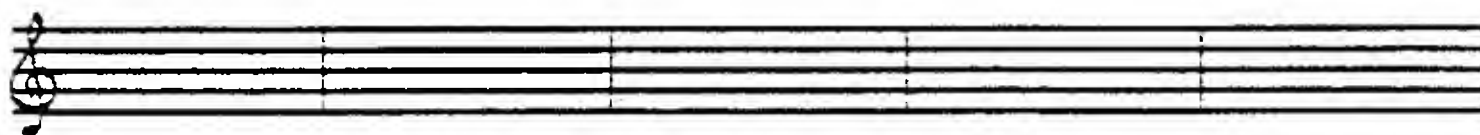
Eb maj7

Eb-(maj7)

Eb6

Eb-6

Eb-7



NAME \_\_\_\_\_

HARMONY I HOMEWORK 68

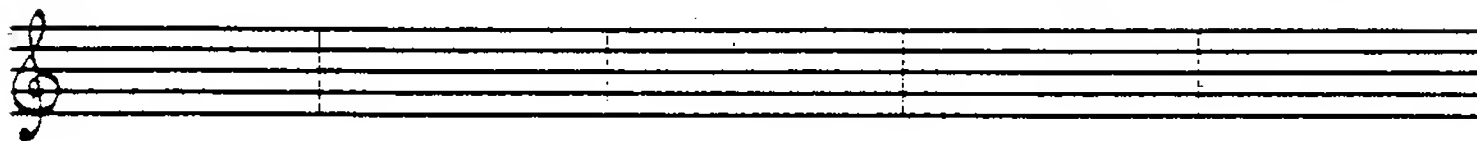
E $\flat$ -7(b5)

E $\flat$ 7

E $\flat$  aug 7

E $\flat$ 7(sus4)

E $\flat$  dim 7



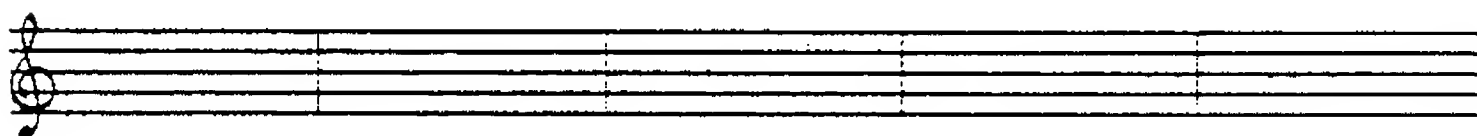
A $\flat$  maj 7

A $\flat$ -(maj 7)

A $\flat$ 6

A $\flat$ -6

A $\flat$ -7



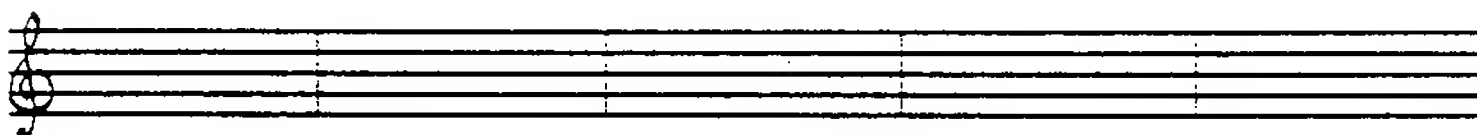
A $\flat$ -7(b5)

A $\flat$ 7

A $\flat$  aug 7

A $\flat$ 7(sus4)

A $\flat$  dim 7



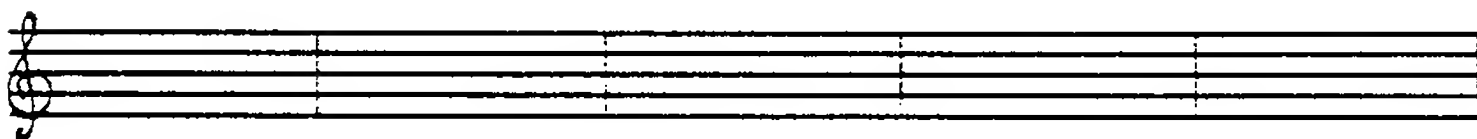
D $\flat$  maj 7

D $\flat$ -(maj 7)

D $\flat$ 6

D $\flat$ -6

D $\flat$ -7



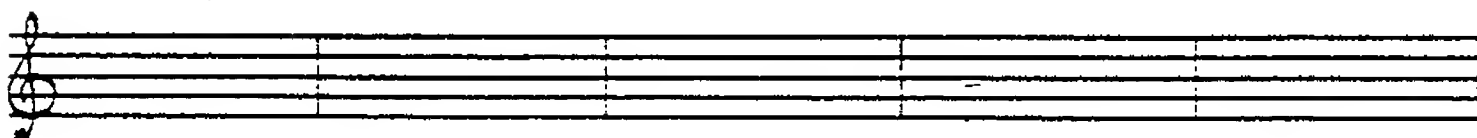
D $\flat$ -7(b5)

D $\flat$ 7

D $\flat$  aug 7

D $\flat$ 7(sus4)

D $\flat$  dim 7



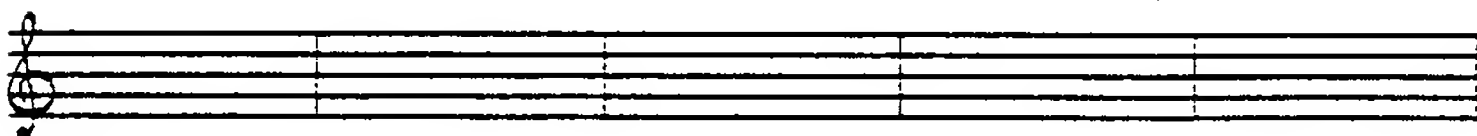
G $\flat$  maj 7

G $\flat$ -(maj 7)

G $\flat$ 6

G $\flat$ -6

G $\flat$ -7



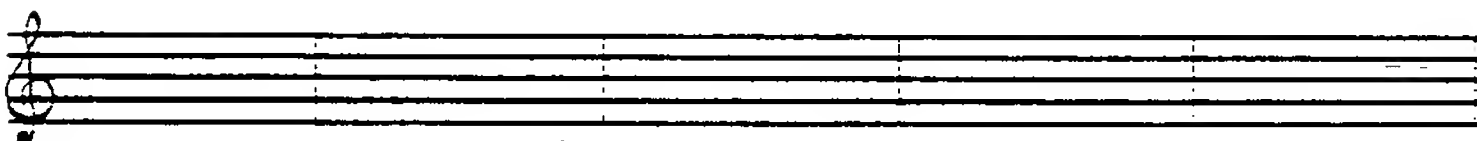
G $\flat$ -7(b5)

G $\flat$ 7

G $\flat$  aug 7

G $\flat$ 7(sus4)

G $\flat$  dim 7



NAME \_\_\_\_\_

HARMONY I HOMEWORK 69

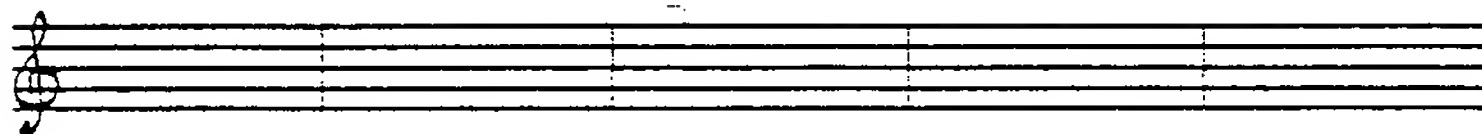
Cb maj7

Cb-(maj7)

Cb6

Cb-6

Cb-7



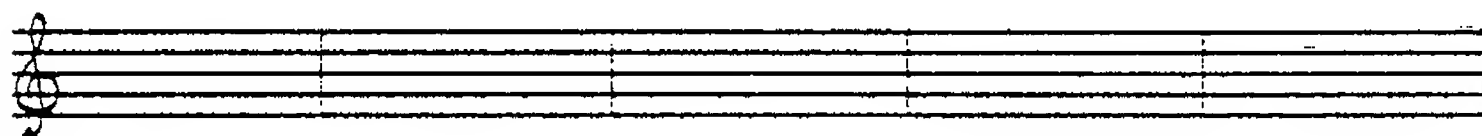
Cb-7(b5)

Cb7

Cb aug7

Cb7(sus4)

Cb dim7



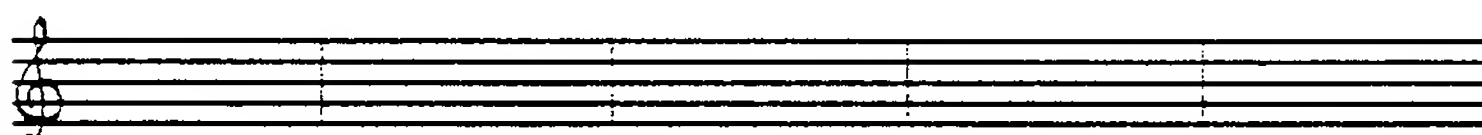
F#maj7

F#-(maj7)

F#6

F#-6

F#-7



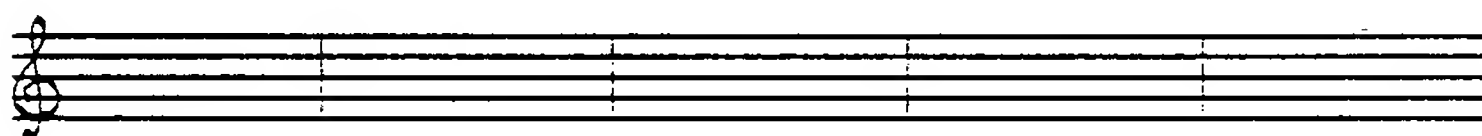
F#-7(b5)

F#7

F# aug7

F#7(sus4)

F# dim7



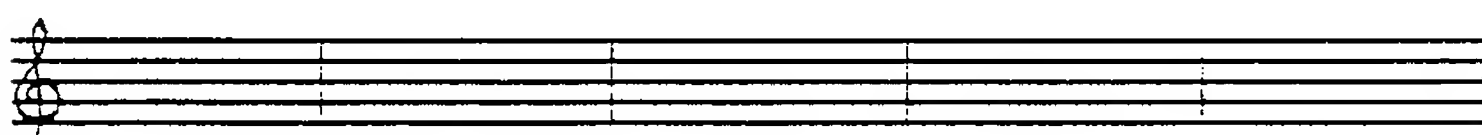
B maj7

B-(maj7)

B6

B-6

B-7



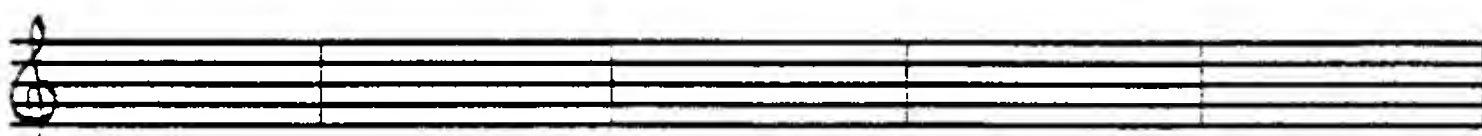
B-7(b5)

B7

B aug7

B7(sus4)

B dim7



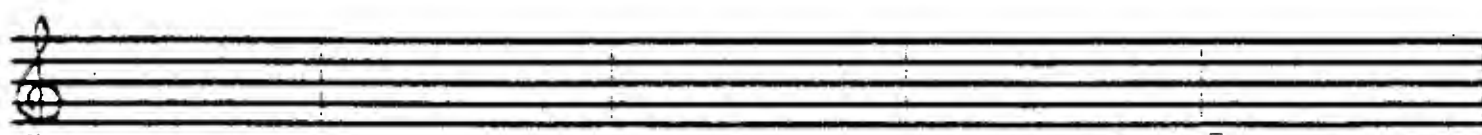
E maj7

E-(maj7)

E6

E-6

E-7



NAME \_\_\_\_\_

HARMONY I HOMEWORK 70

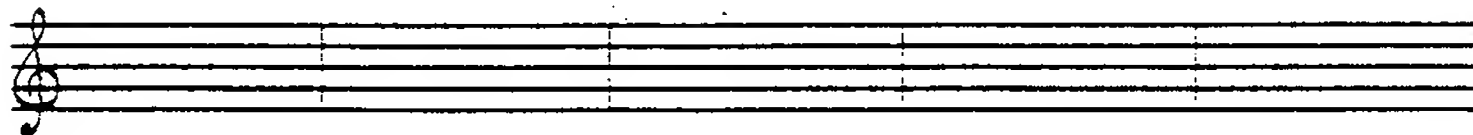
E-7(b5)

E7

E aug7

E7(sus4)

E dim7



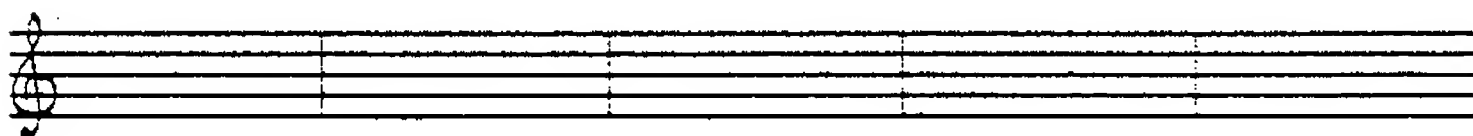
A maj7

A-(maj7)

A6

A-6

A-7



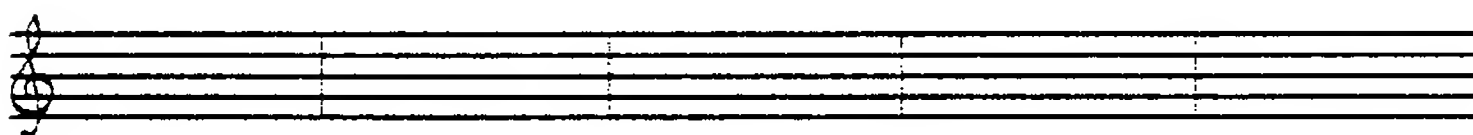
A-7(b5)

A7

A aug7

A7(sus4)

A dim7



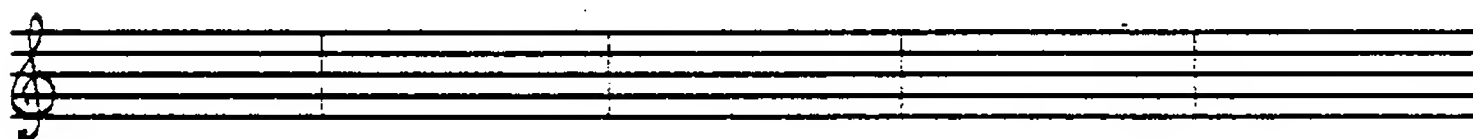
D maj7

D-(maj7)

D6

D-6

D-7



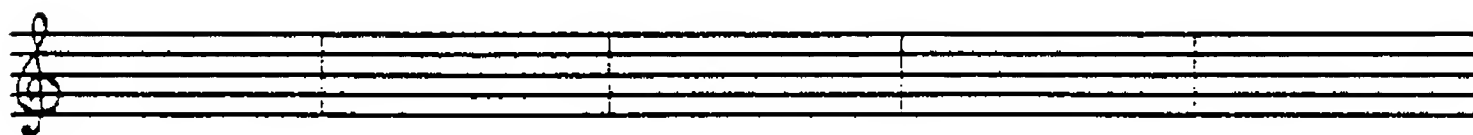
D-7(b5)

D7

D aug7

D7(sus4)

D dim7



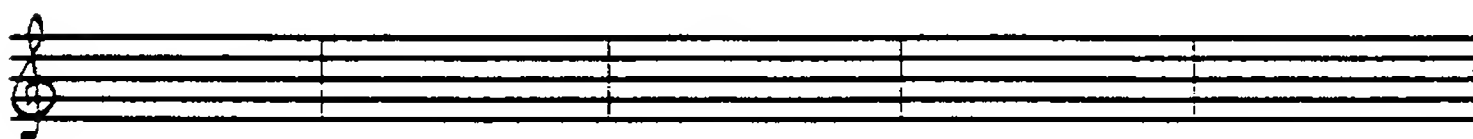
G maj7

G-(maj7)

G6

G-6

G-7



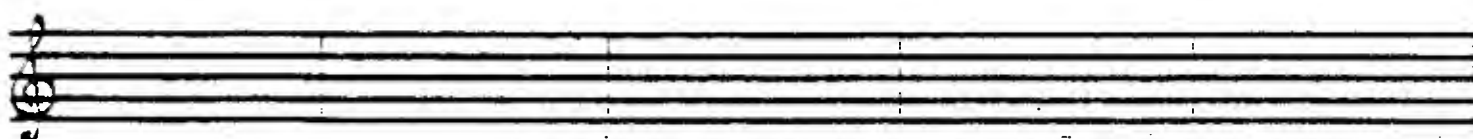
G-7(b5)

G7

G aug7

G7(sus4)

G dim7





NAME \_\_\_\_\_

HARMONY I HOMEWORK 71

17) Realize chord symbols for the following triadic chord structures:

C



NAME \_\_\_\_\_

HARMONY I HOMEWORK 72

- 18) Complete this triadic chord progression by adding the remaining chord tones beneath the melody pitches. Then indicate, beneath the chord, the inversion using the following:

R = Root position; 1 = 1st inversion; 2 = 2nd inversion

F A- D- G B dim C D- F

R

Bb Bb- F B aug E G#- C#- D G E-

A- D- E dim A aug D G aug Gb F dim F

NAME \_\_\_\_\_

HARMONY I HOMEWORK 73

- 19) Realize chord symbols for the piano harmonizations below. All chords have their roots in the bass clef:

C maj7



NAME \_\_\_\_\_

## HARMONY I HOMEWORK 74

- 20) Complete this harmonization of the cycle of fifths by placing the remaining chord tones beneath the melody pitches. Then indicate the inversion for each chord.

R = Root position; 1 = 1st inversion; 2 = 2nd inversion; 3 = 3rd inversion

D-7   G7   C maj7   Bb6   C7(sus4)   F6

R   2   R

C-7   F7   Bb maj7   F-7   Bb7   Eb maj7

Db6   Eb7   Ab maj7   Gb6   Ab7(sus4)   Db6

Ab-7   Db7   Gb maj7   C#-7   F#7   B6

F#-7(b5)   B aug7   E-(maj7)   B-7(b5)   E aug7   A-6

E-7(b5)   A aug7   D-(maj7)   A-7(b5)   D aug7   G maj7

NAME \_\_\_\_\_

HARMONY I HOMEWORK 75

- 21) All the melody pitches below are available tensions. Indicate the tension number for each note:

C maj7      G maj7      C-7      F7      Bb maj7      Eb maj7

A-7      D7      B-7      F7      E7      A-7      D7      G maj7

Gb maj7      F maj7      Ab maj7      G maj7

C#-7(b5)      C-(maj7)      B-7      Bb7      E aug7      A-7      F7      Bb6

NAME \_\_\_\_\_

# HARMONY I HOMEWORK 76

- 22) Realize chord symbols for this piano part. Place in parenthesis the tensions being used. All chords are in root position.